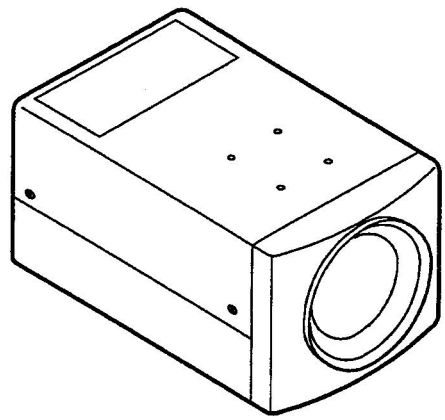
1997

MITSUBISHI Service Manual

VIDEO CAMERA



MODEL

CCD-400E

SPECIFICATIONS

Image pick-up	:	1/4" CCD (total 470,000 pixels)
Number of Pixels (Effective)	:	752 × 582 (440,000 pixels)
Signal System	:	PAL Colour Standard
Scanning System	:	625 lines 2 : 1 Interlace
Scanning Frequency	:	15.625 kHz / 50 Hz
Video Output	:	VBS 1.0 Vp-p / 75 Ω (BNC output)
Horizontal Resolution	:	430 TV Lines (S-Video output)
S/N Ratio (Luminance)	:	More than 46 dB
Minimum Illumination	:	Min. 1 lux / F1.4 (at GAIN-MAX)
Backlight Compensation	:	Available (–30 ~ 30)
White Balance	:	AUTO / INDOOR / FL LIGHT / OUTDOOR / LOCK / MANUAL
Electronic Shutter	:	1/50 ~ 1/10,000 (8 sets)
Lens	:	Electrically powered 14-power zoom lens F1.4, f = 3.9 ~ 54.9 mm
Synchronising System	:	Internal / External
Y/C output	:	S-VIDEO OUT terminal Y :Luminance and Synchronising signals C :Chrominance and Burst signals
Control terminal	:	RS-232C interface (DIN 8 pin)
Power Supply	:	DC 12.0 ± 1.0 V Ripple voltage less than 500 mVp-p (not supplied with camera)
Power Consumption	:	380 mA
Dimensions	:	66 (W) × 55 (H) × 103.5 (D) mm 2.60"(W) × 2.17"(H) × 4.09"(D) (excluding external connector)
Weight	:	Approx. 440 g (0.97 lbs.)
Operational Temperature	:	0 to 40 °C (32 to 104 °F)
Safekeeping Temperature	:	–20 to +60 °C (–4 to +140 °F)

- Weight and dimensions shown are approximate.
- Design and specifications are subject to change without notice.

MITSUBISHI ELECTRIC

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CONTENTS

SAFETY PRECAUTIONS 1
DISASSEMBLY 2
DISASSEMBLING PROCEDURE 2
LENS ASSY 2
REAR ASSY 2
PCB-MAIN 2
PCB-PS ASSY and PCB-POWER 3
LENS ASSY DETAILS 4
REAR ASSY DETAILS 5
PCB-PS ASSY and PCB-POWER DETAILS 5
CIRCUIT ADJUSTMENT 6
1. Jigs and Measuring Instruments 6
2. Adjustment Mode and Initial Setting of the EVR Controller 7
3. Preparation and Check Items for Adjustments 9
4. Precaution 9
ELECTRICAL ADJUSTMENTS 9
ADJUSTMENT PROCEDURES 10
1. Sub Carrier 10
2. Reference Oscillator Frequency 10
3. Focus adjustment 11
4 Amplifier Output of Hall Element 11
5. SYNC Level 12
6. Burst Level 12
7. ALC 13
8. Camera Output Level 13
9. White Balance 14
10. Gain of R-Y and B-Y, and Chroma Phase 15
COSMETIC PARTS REFERENCE 16
PARTS LIST 18
PACKING PARTS 23
BLOCK DIAGRAM
SCHEMATIC DIAGRAM

SAFETY PRECAUTIONS

INTRODUCTION

This manual provides service information for the adjustments of mechanical and electrical operations. Due design modifications, the servicing procedures and data given in this manual are subject to possible change without prior notice.

WARNING:
TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.
THIS EQUIPMENT SHOULD BE USED WITH 12V DC ONLY.

SAFETY NOTICE

Before returning VIDEO CAMERA to the customer, a safety check of the entire VIDEO CAMERA should be made. The service technician must be sure that no protective device built into the instrument by the manufacturer has become defective or inadvertenty damaged during servicing. Observe all caution and safety related notes located on or inside the VIDEO CAMERA cabinet.

WARNING: Alterations of the design or circuitry of this VIDEO CAMERA should not be made. Any design alterations or additions, such as circuit modifications, auxiliary speaker jacks, switches, grounding, active or passive circuitry, etc. use of unauthorised AC power adaptor, battery, cables, accessories, etc. may alter the safety characteristics of this VIDEO CAMERA and potentially create a hazardous situation for the user. Any design alterations or unauthorised additions will invalidate the manufacturer's warranty and will further relieve the manufacturer of responsibility for personal injury or property damage resulting from them.
When reassembling the VIDEO CAMERA, always be certain that all the protective devices are put back in place, such as non-metallic control knobs, shield plates, etc.
When service is required, observe the original lead dress. Components that indicate evidence of overheating or other electrical or mechanical damage should be replaced.

DISASSEMBLY

- Remove the FPC cable only when necessary.
  Do not touch the exposed terminals of the Connector directly with your hand. The unnecessary removal or the direct touch may result in contact failure.
  Handle the FPC cable with extreme care.
  - To remove the FPC cable, hold the Connector for the FPC cable on the area A shown in Fig.1. Pull it in the direction shown by arrow in Fig.1.
  - To insert the Connector, place the Connector with the exposed terminals to the outside of the PCB-MAIN. Push the Connector in the opposite direction of arrow in Fig.1.

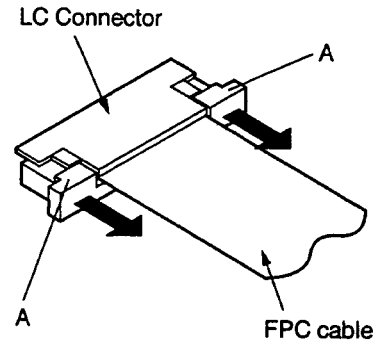


Fig. 1

DISASSEMBLY PROCEDURES

LENS ASSY

Step No.	1	2	3	4	5	6	7
Parts name	UPPER COVER	TRIPOD BASE	LOWER COVER	LENS CAP	FRONT PANEL	REAR ASSY	PCB-MAIN
Number of parts to be removed	①	②	③	– – –	④	⑤	⑥
Screw to be removed	4 pcs.	4 pcs.	4 pcs.	– – –	4 pcs.	2 pcs.	2 pcs.
Terminal to be removed	– – –	– – –	– – –	– – –	– – –	RB, RD	LC, MA, ME

Step No.	8	9	10
Parts name	PCB-PS ASSY and PCB-POWER	LENS COVER	LENS ASSY
Number of parts to be removed	⑦	⑧	⑨
Screw to be removed	3 pcs.	4 pcs.	3 pcs.
Terminal to be removed	– – –	– – –	– – –

- Refer to "LENS ASSY DETAILS" on page 4 for the details of the LENS ASSY.

Note : Removal of FRONT PANEL

1. Remove the four screws (④) shown in Fig. 2.
2. Remove the one Catch shown in Fig. 2.

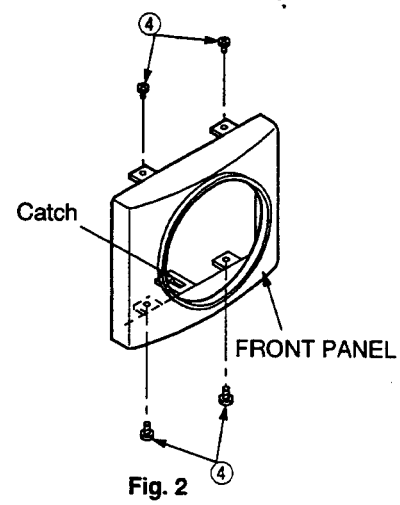


Fig. 2

REAR ASSY

Step No.	1	2	3	6
Parts name	UPPER COVER	TRIPOD BASE	LOWER COVER	REAR ASSY
Number of parts to be removed	①	②	③	⑤
Screw to be removed	4 pcs.	4 pcs.	4 pcs.	2 pcs.
Terminal to be removed	– – –	– – –	– – –	RB, RD

- Refer to "REAR ASSY DETAILS" on page 5 for the details of the REAR ASSY.

PCB-MAIN

Step No.	1	2	3	4	5	6	7
Parts name	UPPER COVER	TRIPOD BASE	LOWER COVER	LENS CAP	FRONT PANEL	REAR ASSY	PCB-MAIN
Number of parts to be removed	①	②	③	– – –	④	⑤	⑥
Screw to be removed	4 pcs.	4 pcs.	4 pcs.	– – –	4 pcs.	2 pcs.	2 pcs.
Terminal to be removed	– – –	– – –	– – –	– – –	– – –	RB, RD	LC, MA, ME

Note :Provide a LENS CAP to protect the lens during the adjustments when not shooting image.

PCB-PS ASSY and PCB-POWER

Step No.	1	2	3	4	5	6	7
Parts name	UPPER COVER	TRIPOD BASE	LOWER COVER	LENS CAP	FRONT PANEL	REAR ASSY	PCB-MAIN
Number of parts to be removed	①	②	③	– – –	④	⑤	⑥
Screw to be removed	4 pcs.	4 pcs.	4 pcs.	– – –	4 pcs.	2 pcs.	2 pcs.
Terminal to be removed	– – –	– – –	– – –	– – –	– – –	RB, RD	LC, MA, ME

Step No.	8
Parts name	PCB-PS ASSY and PCB-POWER
Number of parts to be removed	⑦
Screw to be removed	3 pcs.
Terminal to be removed	– – –

- Refer to "PCB-PS ASSY and PCB-POWER DETAILS" on page 5 for the details of the PCB-PS ASSY and PCB-POWER .

Note : Provide a LENS CAP to protect the lens during the adjustments when not shooting image.

Note : Pull FPC of the gap between UPPER FRAME and PCB-POWER shown in Fig. 3-1.

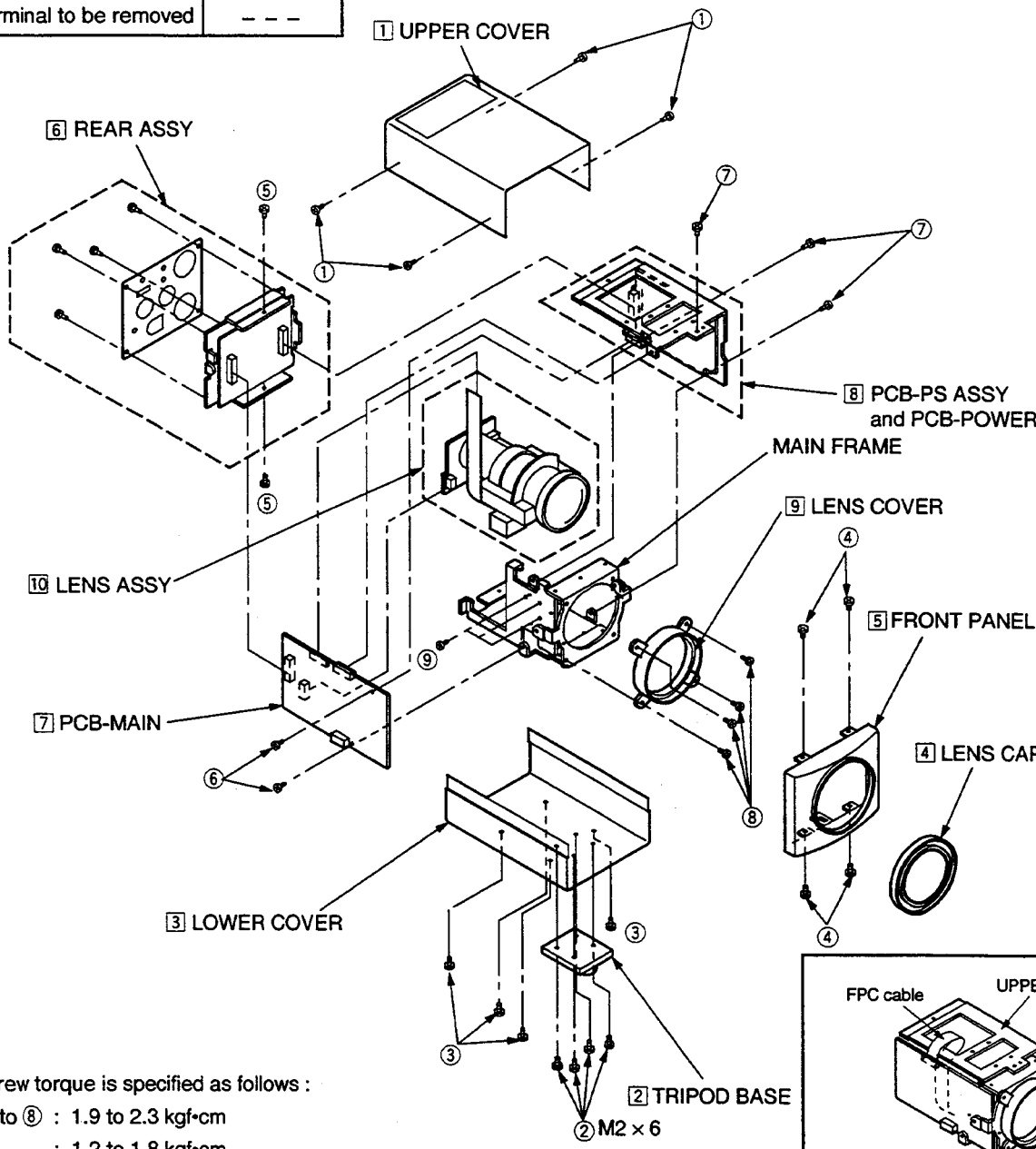


Fig. 3

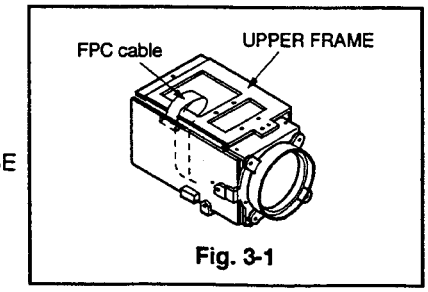


Fig. 3-1

Screw torque is specified as follows :

① to ⑧ : 1.9 to 2.3 kgf•cm

⑨ : 1.2 to 1.8 kgf•cm

LENS ASSY DETAILS

Step No.	1	2	3	4
Parts name	PCB-CCD	CCD SENSOR IC	OPTICAL FILTER PROTECTION RUBBER	OPTICAL FILTER
Number of parts to be removed	①	– – –	– – –	– – –
Screw to be removed	2 pcs.	– – –	– – –	– – –
Terminal to be removed	– – –	– – –	– – –	– – –

Screw torque is specified as follows :

① : 0.7 to 1.7 kgf•cm

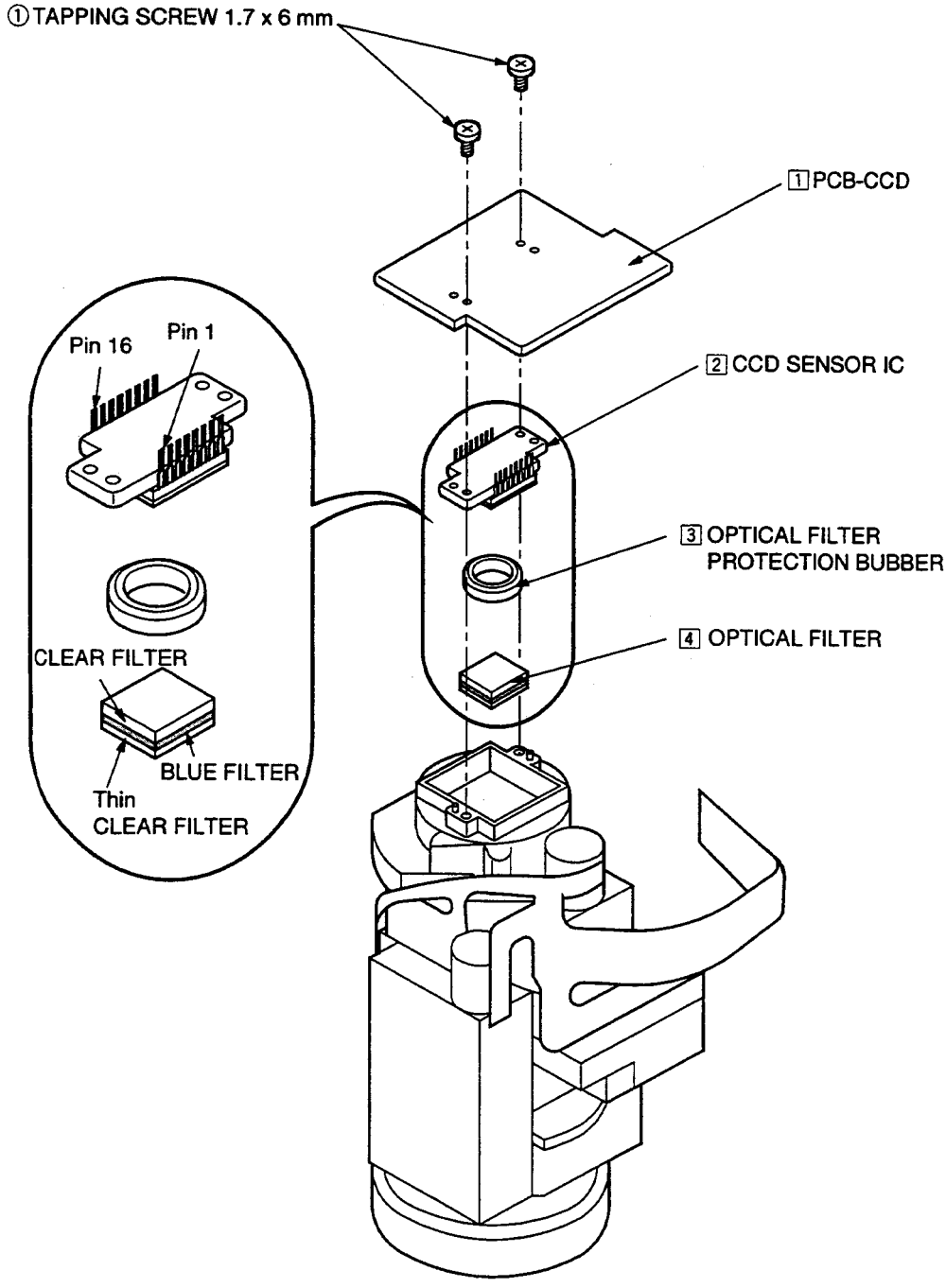


Fig. 4

REAR ASSY DETAILS

Step No.	1
Parts name	REAR COVER
Number of parts to be removed	①
Screw to be removed	4 pcs.
Terminal to be removed	– – –

Screw torque is specified as follows :

① : 1.9 to 2.3 kgf•cm

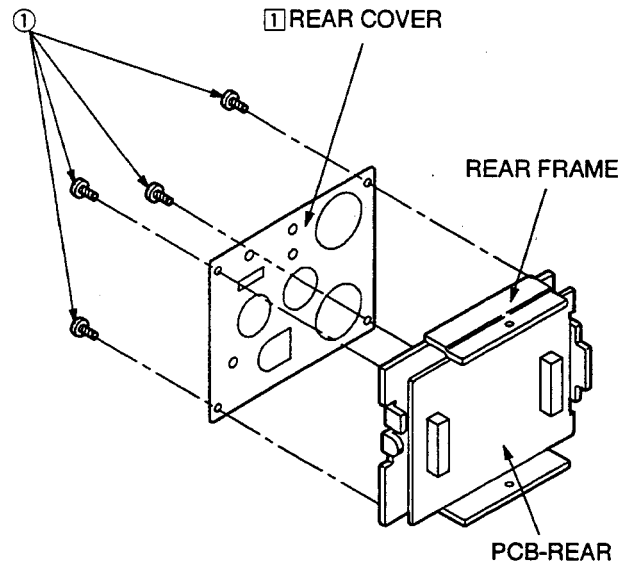


Fig. 5

PCB-PS ASSY and PCB-POWER DETAILS

PCB-PS ASSY

Step No.	1
Parts name	PCB-PS
Number of parts to be removed	① / ②
Screw to be removed	2 pcs./2 pcs.
Terminal to be removed	– – –

PCB-POWER

Step No.	1
Parts name	PCB-POWER
Number of parts to be removed	– – –
Screw to be removed	– – –
Terminal to be removed	– – –

Screw torque is specified as follows :

① : 1.9 to 2.3 kgf•cm

② : 4.1 to 4.9 kgf•cm

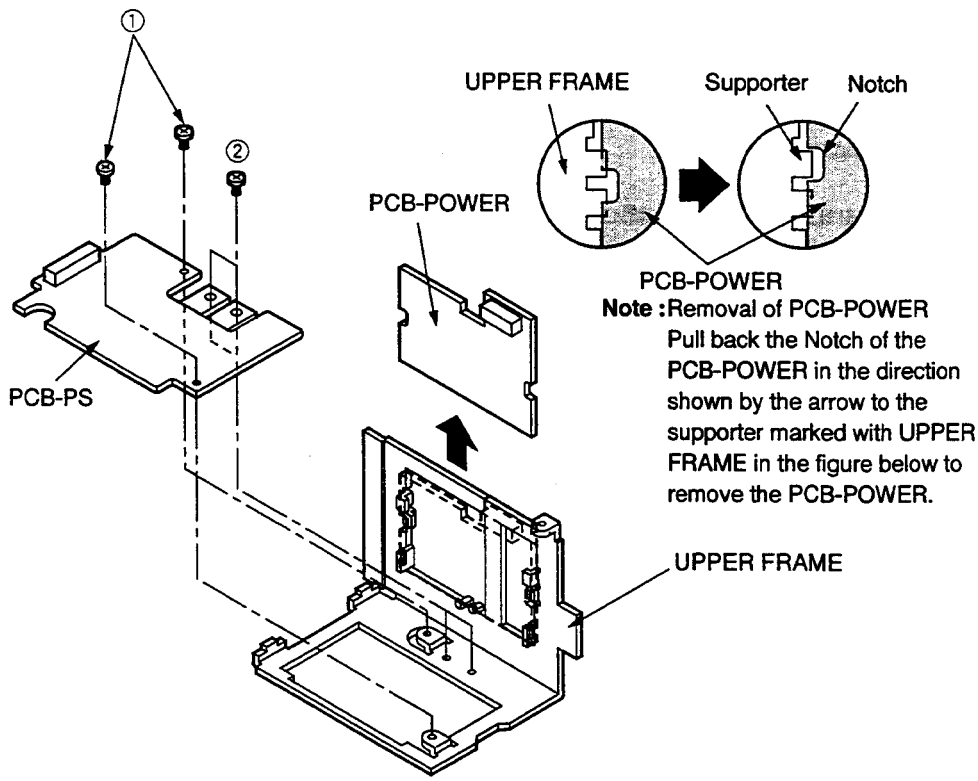
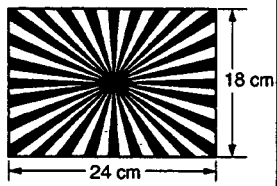
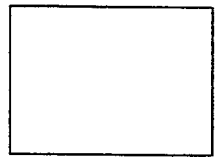
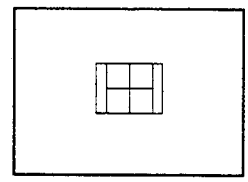
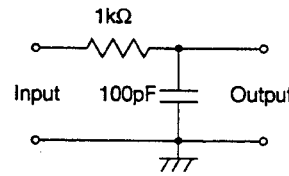

①
②
PCB-PS
PCB-POWER
UPPER FRAME
Supporter
Notch
PCB-POWER
Note : Removal of PCB-POWER
Pull back the Notch of the PCB-POWER in the direction shown by the arrow to the supporter marked with UPPER FRAME in the figure below to remove the PCB-POWER.
UPPER FRAME

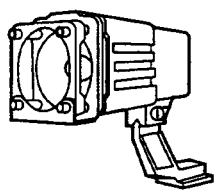
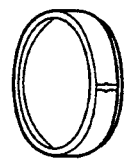
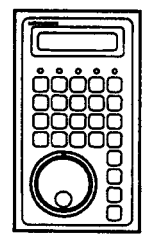
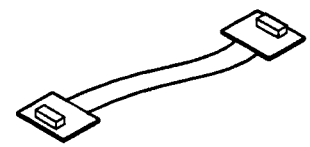
Fig. 6

CIRCUIT ADJUSTMENT

1. Jigs and Measuring Instruments

1-1 Adjusting Jigs

Radial Chart (self-prepared)	White Chart (self-prepared)	Colour Chart 859C397O40 (Reflection type)	Filter (self-prepared)
 The narrower width between lines the better.	 Stick white paper on a square corrugated board (at the same size as the Colour Chart).		

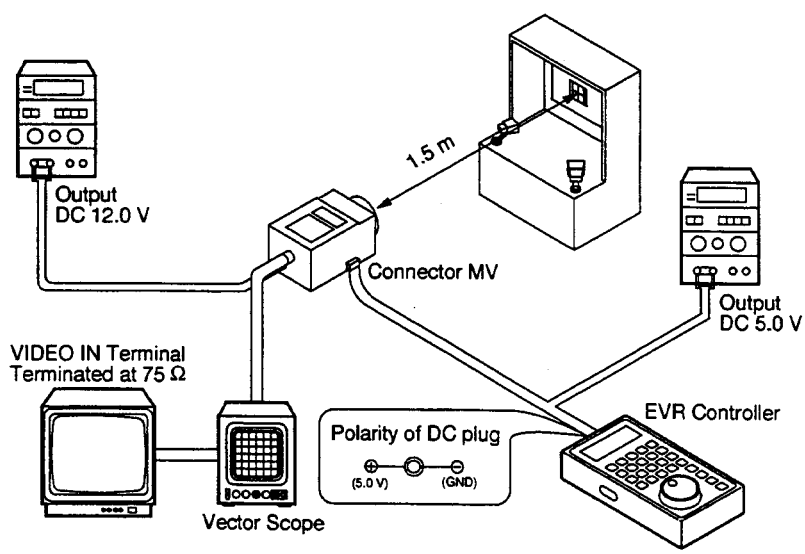
Halogen Light VLT-100 [recommended item]	Conversion Filter for Colour Temperature	EVR Controller 859C546O40	Extension Jigs
	 C2 : 859C361O80	 Use the EVR controller same as that used for CCD-300E.	 MB-RB (26 pin) : 859C545O30 RD-RD (30 pin) : 859C545O80 CA-MA (12 pin) : 859C545O60 DE-ME (18 pin) : 859C545O20

1-2 Other Measuring Instruments

- Oscilloscope (Unless otherwise specified, use 10 : 1 probe.)
- Vector scope
- Illuminometer
- Frequency counter
- Colour monitor (Colour TV)
- Digital voltmeter

1-3 Standard Connection

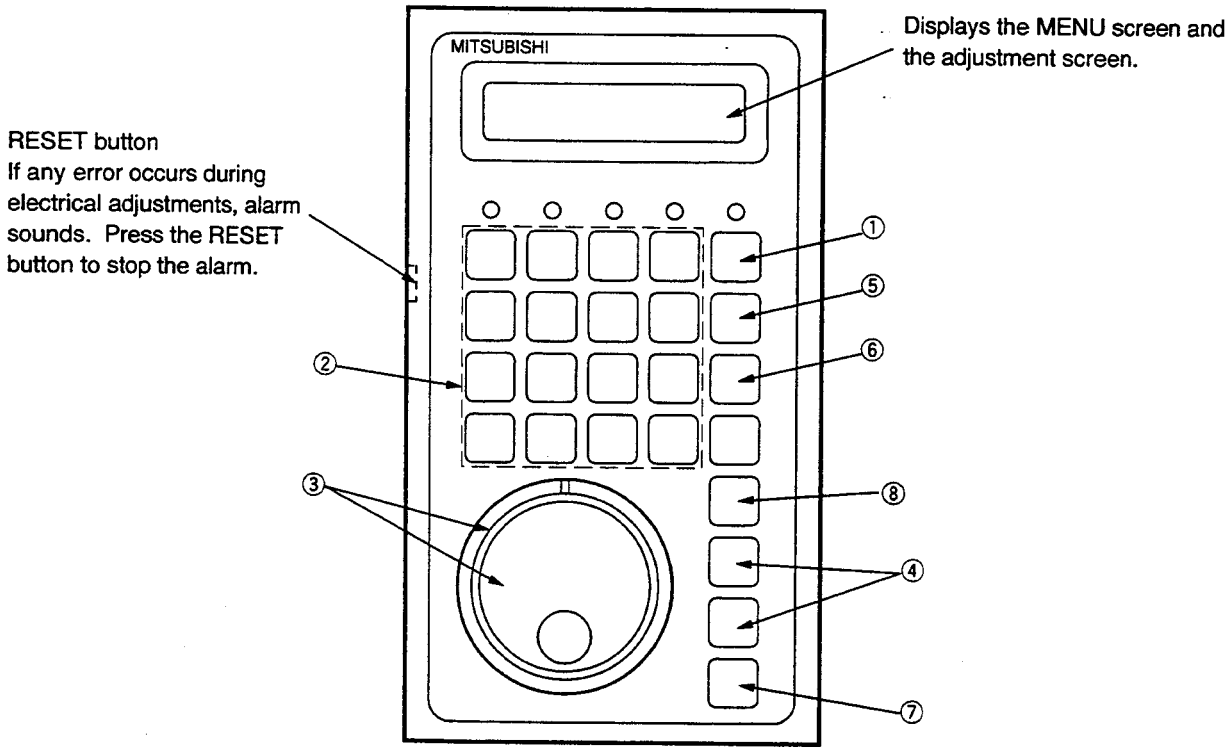
Note : Perform the adjustments with the camera unit assembled using a minimum quantity of the extension cables.



2. Adjustment Mode and Initial Setting of the EVR Controller

Connect the EVR controller for the circuit adjustment (the electron volume adjustment) to set the standard adjustment conditions.
Refer to the previous page for details of the connection.

- Before using the EVR controller, short-circuit between the TPSEL on the PCB-MAIN and the TPGND. (Without the short-circuit, the address or the data cannot be set.)



EVR controller

1. MODE button
   While holding down the MODE button, press the RESET button. This activates the MENU mode.
2. Numeric button
   Used to enter the hexadecimal address and data numbers directly.
   Also used to select a specific mode.
3. Jog dial (inner dial) and shuttle ring (outer ring)
   Rotate to change the address or the data.
4. UP and DOWN buttons
5. ADDR button
   Press the ADDR button and perform either of items 2, 3 or 4 to enter an address.
6. DATA button
   Press the DATA button and perform either of items 2, 3 or 4 to enter the data.
7. ENTER button
   Press the ENTER button to write the data into the memory.
8. BACK button
   Press the BACK button to change the data back to the original one. This function is inoperative once the ENTER button is pressed.

- Perform the adjustments according to the steps below:

1. Mode Selection

(1) While holding down the MODE button, press the RESET button.

```
MENU  0 : EVR      1 : DAC
2 : COPY  3 : ED 4 : SM
```

(2) Press "0" of the numeric button. (0 : Selects EVR.)

```
MENU
0 : NTSC  1 : PAL
```

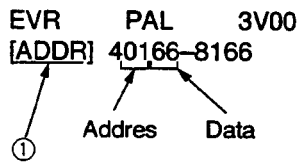
(3) Press "1" of the numeric button. (1 : Selects PAL.)

```
MENU     0 : NORMAL
         1 : PROGRAM
```

(4) Press "0" of the numeric button. (0 : Selects NORMAL.)

```
EVR      PAL      3V00
[ADDR] 40166–8166
```

2. Setting Value Change



(1) Before changing the address, make sure that 1 reads ADDR.
(If 1 reads DATA, press the ADDR button.)
(2) Set the address using the UP and DOWN buttons, the numeric buttons, or the jog dial.
(3) Press the DATA button. (1 reads DATA.)
(4) Set the Data using the UP and DOWN buttons, the numerical buttons or the jog dial.
(5) Press the ENTER button (to write the data into the memory).

3. Preparation and Check Items for Adjustments

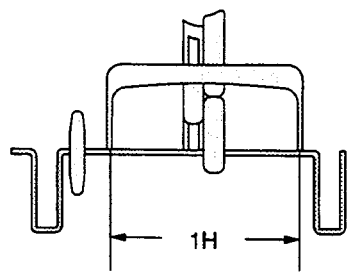
3-1 Preparation and check items

1. Use a lamp with the colour temperature of 3,200 ± 50°K to illuminate the chart. Set the lamp so that the luminance on the chart surface is kept at about 2,000 lux. Install the lamp for even illumination on the surface. (Two or more light sources are preferable.) Uneven illumination may result in poor adjustments.
2. Perform the adjustments with the camera unit assembled using as few extension cables as possible.
3. Unless otherwise specified, the distance from an object to the camera unit shall be 1.5 m.

3-2 Setting of Standard Angle of View

Unless otherwise specified, shoot a chart for the adjustments at the standard angle of view detailed below.

1. Shoot the Colour Chart (4-colour).
2. Observe the waveform at the TPVDO on the oscilloscope.
3. Adjust the power zoom so that the period from the rise to fall of the grey signal equals the full effective range of the horizontal signal as shown in the figure below.



3-3 Standard Condition Setting

1. Unless otherwise specified, set each function of the video camera as specified below.

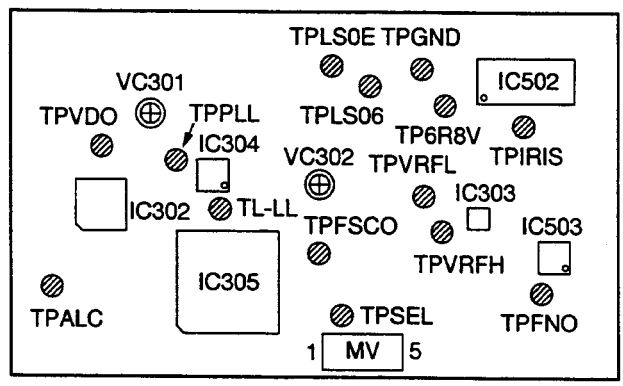
Shutter	NORMAL (1/50 sec)
Focus	Manual
Back light compensation	Off
White balance	Indoor

4. Precaution

This camera unit is adjusted with an electric volume. After replacing a PCB or a lens unit, make sure that the data values are adjusted as specified in the Circuit Adjustment. If any value is not given as specified in CIRCUIT ADJUSTMENT. If not, perform the adjustment again.

ELECTRICAL ADJUSTMENT

PCB-MAIN (Component side)



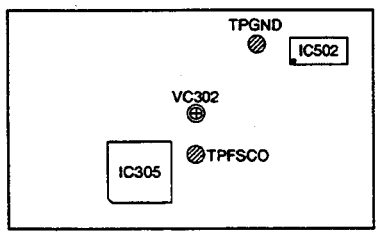
ADJUSTMENT PROCEDURES

1. Sub Carrier	**Adjustment purpose**	To set the frequency of the 4.43MHz oscillation circuit.
	Symptom when incorrectly adjusted	No colour due to no colour signal output or wrong colours due to colour phase shift on the screen.

Measuring instrument	Frequency counter
Test point	TPFSCO
EXT trigger	– – –
Measurement range	– – –
Chart used	– – –

1. Observe the frequency at TPFSCO.
2. Adjust VC302 to set the frequency to 4.433619 ± 0.000002 MHz.

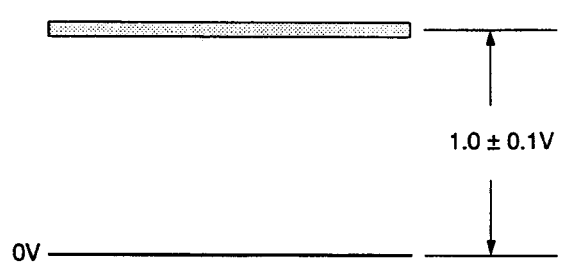
PCB-MAIN (Component side)



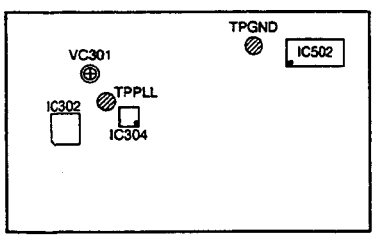
2. Reference Oscillator Frequency	**Adjustment purpose**	To set the voltage to lock the PLL circuit in the main signal process circuit.
	Symptom when incorrectly adjusted	Disturbance or no colour on the screen.

Measuring instrument	Oscilloscope
Test point	TPPLL
EXT trigger	– – –
Measurement range	DC mode DIV 50mV
Chart used	– – –

1. Observe the waveform at TPPLL on an oscilloscope.
2. Adjust VC301 so that the central value of the waveform is 1.0 ± 0.1V.



PCB-MAIN (Component side)

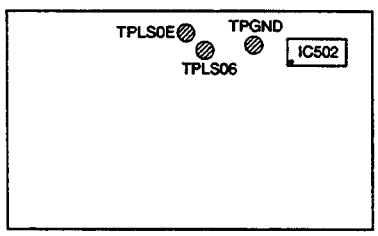


3. Focus adjustment	**Adjustment purpose**	To set optimum back focus of lens.
	Symptom when incorrectly adjusted	Out of focus when zooming.

Measuring instrument	Oscilloscope
Test point	– – –
EXT trigger	– – –
Measurement range	– – –
Chart used	Radial Chart

1. Position the Radial Chart at least 10 meters apart from the Camera.
   (Attach the Chart to a wall. Do not illuminate the Chart.)
2. Shoot the Chart in WIDE mode.
   Make sure that the Camera does not shoot any object set ahead of the Chart.
   (If shot, provide a barrel or the equivalent on the lens unit.)
3. Short-circuit between TPLS0E and TPGND for about 2 seconds.
4. Turn the power OFF for 5 seconds or more and then turn the power ON again.
5. Short-circuit between TPLS06 and TPGND for about 2 seconds.
   (The steps will activate the focus automatic adjustment mode.
   The automatic adjustment is completed in about 45 seconds.)
6. Adjust and lock the focus to optimum in TELE mode.
7. Set the zooming speed to the items other than VERY FAST.
8. Make sure the zoom tracking is optimum when the Camera zooms out.

PCB-MAIN (Component side)

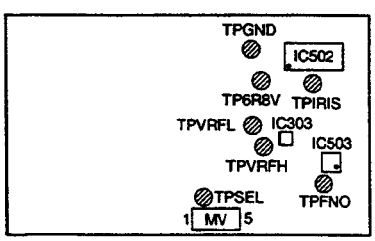


4. Amplifier Output of Hall Element	**Adjustment purpose**	To set the sensor voltage of both sides of iris to write the data in the EEPROM.
	Symptom when incorrectly adjusted	Poor response of auto focus.

Measuring instrument	Oscilloscope
Test point	TPFNO, TPVRFL TPVRFH
EXT trigger	– – –
Measurement range	DC mode DIV 50mV
Chart used	– – –

1. Short-circuit between TPSEL and TPGND (EVR adjustment mode).
2. Short-circuit between TPIRIS and TPGND (with the lens closed).
3. Set the address of the EVR controller to 0F.
4. Adjust the data of the EVR controller so that the DC voltage at TPFNO and TPVRFL are equal.
5. Open-circuit between TPIRIS and TPGND.
6. Connect TPIRIS to TL6R8V (with the lens open).
7. Set the address of the EVR controller to 0E.
8. Adjust the data of the EVR controller so that the DC voltage at TPFNO and TPVRFH are equal.
9. Open-circuit between TPIRIS and TL6R8V.
10. Repeat the above procedure from step 1 through 9 until TPFNO value is TPVRFL ± 50mV and TPVRFH ± 50mV respectively.
11. Press the ENTER button on the EVR controller (to write the data in the EEPROM.)
12. Set the address of the EVR controller to 0F.
13. Press the ENTER button on the EVR controller (to write the data in the EEPROM.)
14. Open-circuit between TPIRIS and TL6R8V.
15. Open-circuit between TPSEL and TPGND.

PCB-MAIN (Component side)

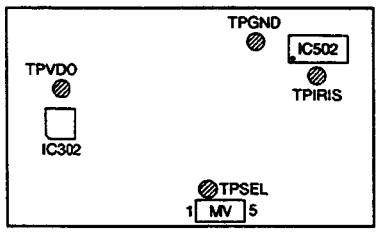


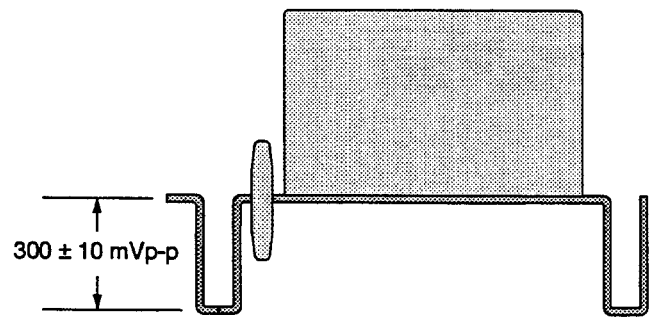
5. SYNC Level	**Adjustment purpose**	To set the level of synchronisation signals.
	Symptom when incorrectly adjusted	Out of synchronisation or wrong colour density.

Measuring instrument	Oscilloscope
Test point	TPVDO
EXT trigger	– – –
Measurement range	DIV 10mV TIM 5µs
Chart used	– – –

1. Short-circuit between TPSEL and TPGND (EVR adjustment mode).
2. Short-circuit between TPIRIS and TPGND (with the lens closed).
3. Observe the waveform at TPVDO.
4. Set the address of the EVR controller to 0C.
5. Adjust the data of the EVR controller so that the SYNC on the waveform is 300 ± 10mVp-p.
6. Press the ENTER button on the EVR controller (to write the data in the EEPROM.)
7. Open-circuit between TPIRIS and TPGND.
8. Open-circuit between TPSEL and TPGND.

PCB-MAIN (Component side)



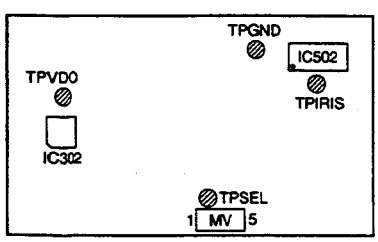


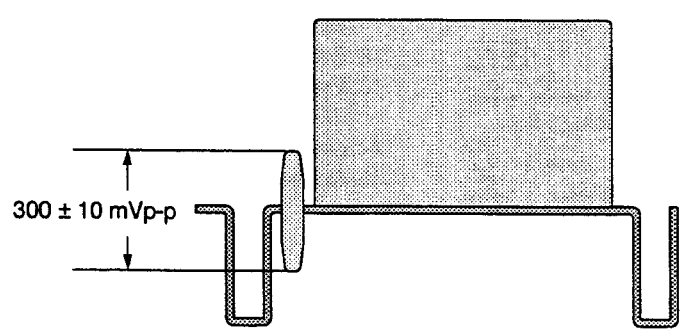
6. Burst Level	**Adjustment purpose**	To set the correct chroma level of video output signals.
	Symptom when incorrectly adjusted	Wrong colours.

Measuring instrument	Oscilloscope
Test point	TPVDO
EXT trigger	– – –
Measurement range	DIV 10mV TIM 5µs
Chart used	– – –

1. Short-circuit between TPSEL and TPGND (EVR adjustment mode).
2. Short-circuit between TPIRIS and TPGND (with the lens closed).
3. Observe the waveform at TPVDO.
4. Set the address of the EVR controller to 0D.
5. Adjust the data of the EVR controller so that the burst level is 300 ± 10mVp-p.
6. Press the ENTER button on the EVR controller (to write the data in the EEPROM).
7. Open-circuit between TPIRIS and TPGND.
8. Open-circuit between TPSEL and TPGND.

PCB-MAIN (Component side)



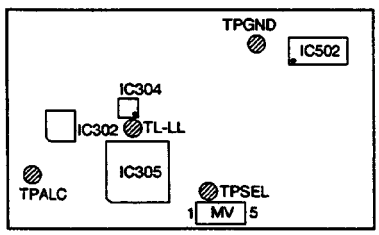


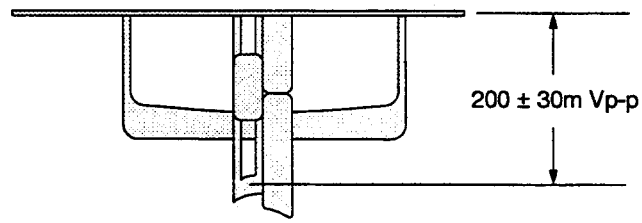
7. ALC	**Adjustment purpose**	To set the standard iris level.
	Symptom when incorrectly adjusted	Poor gradation or picture whitening.

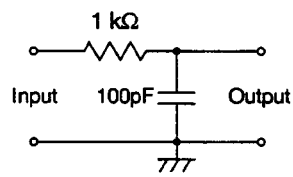
Measuring instrument	Oscilloscope
Test point	TPALC
EXT trigger	TL-LL
Measurement range	DIV 20mV TIM 5μs
Chart used	Colour Chart (4-colour)

1. Short-circuit between TPSEL and TPGND (EVR adjustment mode).
2. Display the Colour Chart (4-colour) at the standard viewing angle.
3. Observe the waveform at TPALC using the low pass filter shown in below firure.
4. Set the address of the EVR controller to 2C.
5. Adjust the data of the EVR controller to set the white level to 200 ± 30mVp-p.
6. Press the ENTER button on the EVR controller (to write the data in the EEPROM).
7. Open-circuit between TPSEL and TPGND.

PCB-MAIN (Component side)





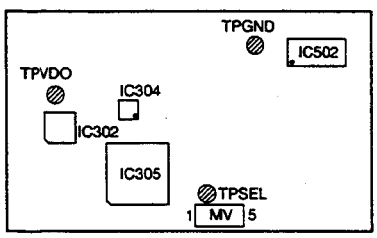


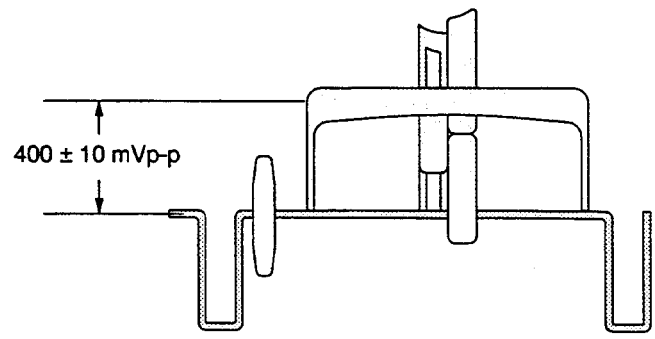
8. Camera Output Level	**Adjustment purpose**	To set the AGC of the video process circuit.
	Symptom when incorrectly adjusted	Too bright or too dark picture.

Measuring instrument	Oscilloscope
Test point	TPVDO
EXT trigger	– – –
Measurement range	DIV 20mV TIM 5μs
Chart used	Colour chart (4-colour)

1. Short-circuit between TPSEL and TPGND (EVR adjustment mode).
2. Display the Colour Chart (4-colour) at the standard viewing angle.
3. Observe the waveform at TPVDO.
4. Set the address of the EVR controller to 02.
5. Adjust the data to set the grey level to 464 ± 10mVp-p.
6. Press the ENTER button on the EVR controller (to write the data in the EEPROM).
7. Open-circuit between TPSEL and TPGND.

PCB-MAIN (Component side)

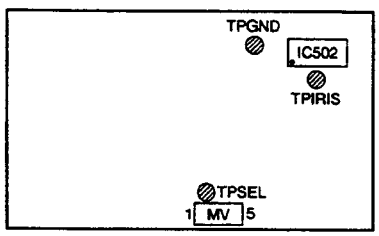




9. White Balance	**Adjustment purpose** To set the reference value when displaying white on the screen. **Symptom when incorrectly adjusted** A reddish or bluish picture.

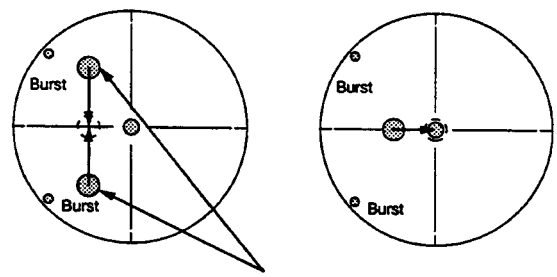
Measuring instrument	Vector scope
Test point	Video output terminal
EXT trigger	– – –
Measurement range	GAIN MAXIMUM
Chart used	White chart

PCB-MAIN (Component side)



Note : If the illuminance on the object is less than the specified one provide a Conversion Filter (C2 : 859C361O80) for the adjustment.

1. Turn the power off and turn the power on again. (Indoor white balance mode)
2. Short-circuit between TPSEL and TPGND. (EVR adjustment mode)
3. Display the white chart on the overall monitor screen.
4. Observe the waveform at the video output terminal on a vector scope.
5. Maximise the sensitivity of the vector scope.
6. Set the address of the EVR controller to 27.
7. Adjust the EVR controller data so that the bright spot of the burst falls on the centre line of the vector scope (adjustment in the vertical direction) as shown in the figure below.
8. Press the ENTER button on the EVR controller (to write data in the EEPROM).
9. Set the address of the EVR controller to 28.
10. Adjust the EVR controller data so that the bright spot of the burst falls on the centre of the vector scope (adjustment in the horizontal direction) as shown in the figure below.
11. Press the ENTER button on the EVR controller (to write data in the EEPROM).
12. Open-circuit between TPSEL and TPGND.

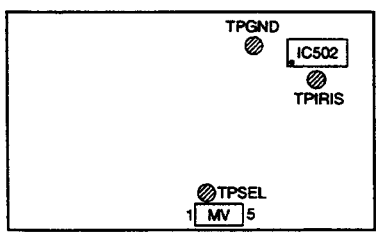


2 luminescence points
falls the centre line

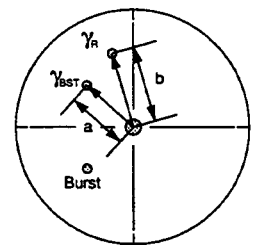
10. Gain of R-Y and B-Y, and Chroma Phase	**Adjustment purpose**	To set the phase of colour signals.
	Symptom when incorrectly adjusted	Wrong colours due to colour phase shift.

Measuring instrument	Vector scope
Test point	Video output terminal
EXT trigger	– – –
Measurement range	GAIN
Chart used	Colour chart (4-colour)

PCB-MAIN (Component side)

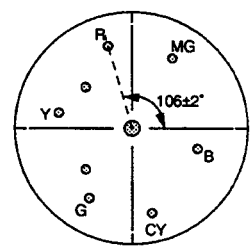


1. Turn the power off and turn the power on again (Indoor white balance mode).
2. Short-circuit between TPSEL and TPGND (EVR adjustment mode).
3. Display the Colour Chart (4-colour) at the standard viewing angle.
4. Observe the waveform at the video output terminal on a vector scope.
5. Set the address of the EVR controller to 07.
6. Adjust the data of the EVR controller so that the distance from the centre of the bright spot of the red signal to the centre of the vector scope "γ_R" is 1.2 times the distance from the centre of the burst signal to the centre of the vector scope "γ_{BST}".

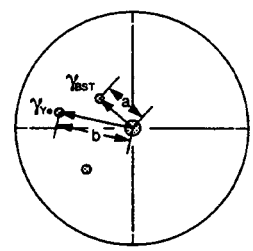


$\frac{b}{a} = 1.2$

7. Set the address of the EVR controller to 09.
8. Adjust the data of the EVR controller so that the phase of the bright spot of the red signal is 106 ± 2°.



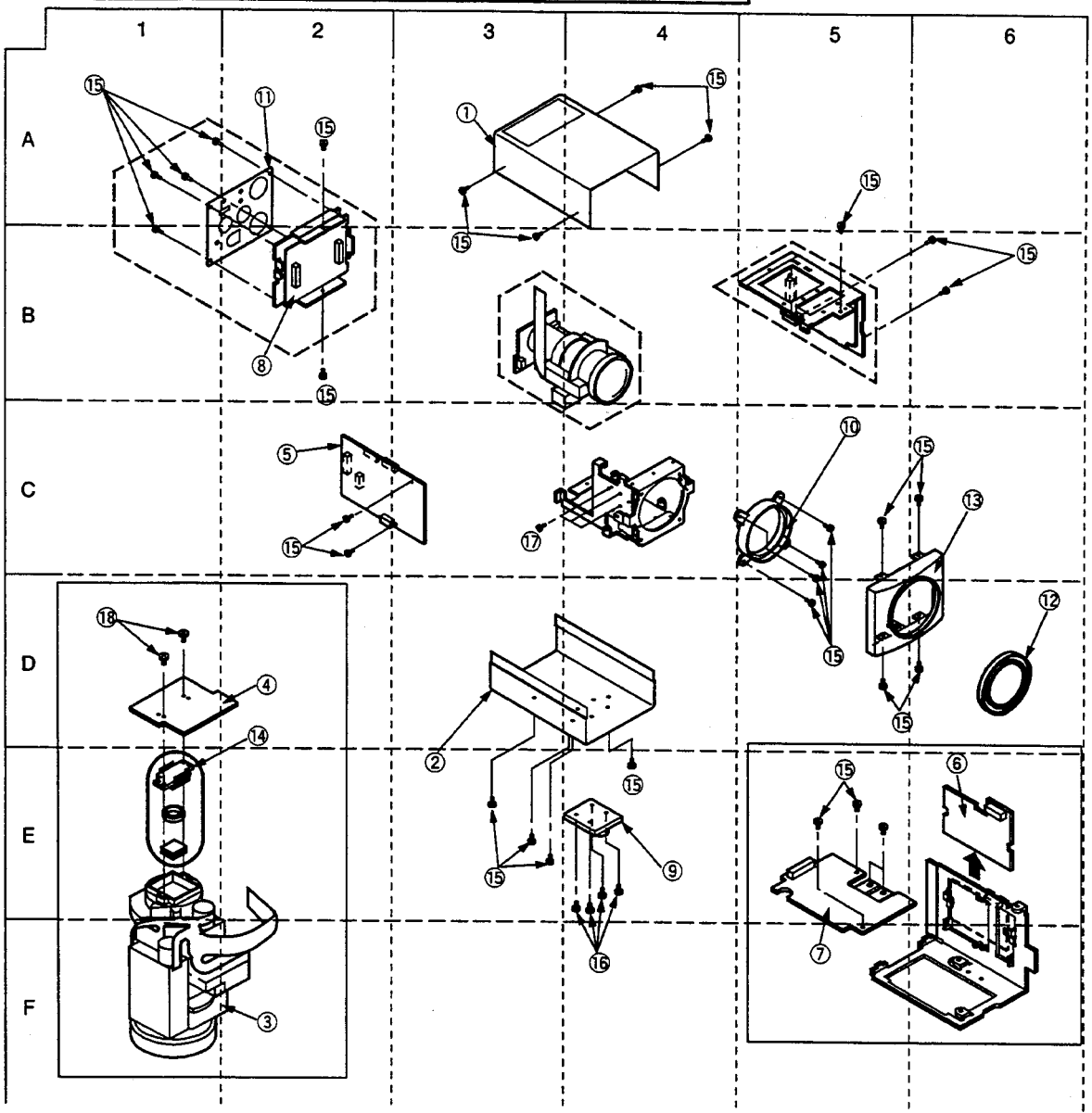
9. Set the address of the EVR controller to 08.
10. Adjust the data of the EVR controller so that the distance from the centre of the bright sport of the yellow signal "γ_{Ye}" is 1.7 times the distance from the centre of the burst signal "γ_{BST}".



$\frac{b}{a} = 1.7$

11. Perform the above procedure from steps 3 through 5 again. Make sure that the values are correctly adjusted. (If not, repeat the steps 3 to 5 until the values are set as specified.)
12. Press the ENTER button on the EVR controller respectively in the addresses specified in the steps 3 through 5 above (to write the data in the EEPROM).
13. Open-circuit between TPSEL and TPGND.

COSMETIC PARTS REFERENCE



ITEM NO.	PARTS NAME	ADDRESS	PARTS NO.
1	UPPER COVER	A-3	589D070O60
2	LOWER COVER	E-3	710B036O20
3	UNIT LENS	F-2	490P177O10
4	CCD PCB ASSY	D-2	925B043O02
5	MAIN PCB ASSY	C-2	928D421O02
6	POWER PCB ASSY	E-6	928D422O01
7	PS PCB ASSY	F-5	928D419O02
8	REAR PCB ASSY	B-2	928D420O02
9	TRIPOD BASE	E-4	769C006O10
10	LENS COVER	C-5	701B377O10
11	REAR COVER	A-2	710C035O10
12	LENS CAP	D-6	701C074O10

ITEM NO.	PARTS NAME	ADDRESS	PARTS NO.
13	FRONT PANEL	C-6	701B376O10
14	CCD SENSOR IC	D-2	274D041O50
15	SCREW	A-1, A-2, A-4, B-2, B-3, B-6, C-2, C-6, D-5, E-3, E-4, E-5	669D372O10
16	SCREW	F-4	669D372O20
17	SCREW	C-3	669D435O20
18	SCREW	D-1	669D435O50

[MEMO]

PARTS LIST

SYMBOL No.	PARTS No.	PARTS NAME	DESCRIPTION
		INTEGRATED CIRCUITS	
IC2AA	274D041O50	CCD SENSOR IC	
IC301	263P220O10	IC	SC7SU04F<E6>
IC302	274P938O10	IC	CXD2480R
IC303	274P924O10	IC	TA75W01FU
IC304	274P932O10	IC	MB88347PFV-G-BNDEF
IC305	274P937O10	IC	CXD2163R
IC306	274P926O10	IC	TC7W04FU
IC307	274P936O10	IC	CXA2006Q
IC308	274P923O10	IC	MM1024AFF
IC401	274P930O10	IC	M38067M8-XXXGP
IC402	274P933O30	IC	S29391AFJ
IC403	274P928O10	IC	TC74LVX04FS
IC404	274P991O10	IC	TC74VHCT04FS
IC405	263P440O10	IC	S8054HNM-T1<CQ>
IC406	274P927O10	IC	TC7W74FU
IC407	274P929O10	IC	M35040-001FP
IC408	270P560O10	IC	µPD4721GS-GJG
IC410	274P990O10	IC	TC7W241FU
IC501	274P925O10	IC	TB6512AF
IC502	274P925O10	IC	TB6512AF
IC503	272P485O20	IC	NJM2902V
IC504	274P934O10	IC	MN1882010MHA
IC505	274P933O10	IC	S29191AFJ
IC506	274P935O10	IC	MN7A004VSW
IC508	274P760O20	IC	TC4W53FU
IC601	272P674O10	IC	M5237ML<37>
IC602	263P220O10	IC	SC7SU04F<E6>
IC603	263P220O10	IC	SC7SU04F<E6>
IC604	274P076O10	IC	SC7S32F
IC605	272P366O10	IC	LM311PS
IC606	275P090O10	IC	SN74HC161DB
IC901	274P931O10	IC	MB3785APFV-G-BNDEF
		TRANSISTORS	
Q 2AA	260P854O30	CHIP TRANSISTOR	2SC4098-Q
Q 301	260P859O50	CHIP TRANSISTOR	2SA1576-R
Q 302	260P854O30	CHIP TRANSISTOR	2SC4098-Q
Q 303	260P859O50	CHIP TRANSISTOR	2SA1576-R
Q 304	260P854O30	CHIP TRANSISTOR	2SC4098-Q
Q 401	260P857O30	CHIP TRANSISTOR	UN5213
Q 402	260P857O30	CHIP TRANSISTOR	UN5213
Q 501	260P857O30	CHIP TRANSISTOR	UN5213
Q 502	260P855O90	CHIP TRANSISTOR	2SD1819A-S
Q 503	260P855O90	CHIP TRANSISTOR	2SD1819A-S
Q 504	260P845O10	CHIP TRANSISTOR	IMX1
Q 601	260P854O30	CHIP TRANSISTOR	2SC4098-Q
Q 602	260P710O10	TRANSISTOR	2SC1568-S
Q 603	260P701O10	CHIP TRANSISTOR	2SA1213-Y
Q 604	260P710O10	TRANSISTOR	2SC1568-S
Q 605	260P849O10	CHIP TRANSISTOR	IMZ1
Q 606	260P859O50	CHIP TRANSISTOR	2SA1576-R
Q 607	260P857O30	CHIP TRANSISTOR	UN5213
Q 901	260P914O10	TRANSISTOR	2SB1122
Q 902	261P059O10	TRANSISTOR	FP102
Q 903	261P058O10	TRANSISTOR	FP101
Q 904	260P859O50	CHIP TRANSISTOR	2SA1576-R
Q 905	260P855O90	CHIP TRANSISTOR	2SD1819A-S
Q 906	261P058O10	TRANSISTOR	FP101
		DIODES	
D 2AA	264P837O10	CHIP DIODE	MA141K
D 2AB	264P837O10	CHIP DIODE	MA141K
D 301	264P834O10	CHIP DIODE	MA341
D 601	264P816O90	CHIP DIODE	RD11MB2
D 602	264P831O10	CHIP DIODE	SFPB-54V
D 603	264P831O10	CHIP DIODE	SFPB-54V
D 901	264P738O10	CHIP DIODE	MA796
		FILTERS	
CF401	299P219O10	CERAMIC OSCILLATOR	PBRC-8.00BR
CF501	299P219O10	CERAMIC OSCILLATOR	PBRC-8.00BR
LF301	409P785O10	CHIP LOW PASS FILTER	MXF3535DR180
		COILS	
L 301	325C220O40	CHIP COIL	1.8µH-J
L 302	325C221O10	CHIP COIL	6.8µH-J
L 303	325C221O10	CHIP COIL	6.8µH-J
L 304	325C221O30	CHIP COIL	10µH-J
L 305	325C221O30	CHIP COIL	10µH-J
L 306	325C221O30	CHIP COIL	10µH-J
L 307	325C221O30	CHIP COIL	10µH-J
L 308	325C221O30	CHIP COIL	10µH-J
L 309	325C221O30	CHIP COIL	10µH-J
L 310	325C221O30	CHIP COIL	10µH-J
L 311	325C222O30	CHIP COIL	68µH-J
L 312	325C221O30	CHIP COIL	10µH-J
L 313	325C221O70	CHIP COIL	22µH-J
L 401	325C221O30	CHIP COIL	10µH-J
L 402	325C221O70	CHIP COIL	22µH-J
L 403	325C222O50	CHIP COIL	100µH-J
L 404	325C221O30	CHIP COIL	10µH-J
L 501	325C221O10	CHIP COIL	6.8µH-J
L 502	325C221O10	CHIP COIL	6.8µH-J
L 503	325C221O10	CHIP COIL	6.8µH-J
L 504	325C221O10	CHIP COIL	6.8µH-J
L 505	325C221O10	CHIP COIL	6.8µH-J
L 506	325C221O10	CHIP COIL	6.8µH-J
L 601	325C241O30	CHIP COIL	10µH-K
L 901	351P160O10	CHIP COIL	CDRH62 10µH
L 902	351P160O10	CHIP COIL	CDRH62 10µH
L 903	351P160O10	CHIP COIL	CDRH62 10µH
L 904	351P160O30	CHIP COIL	CDRH62 33µH
L 908	351P160O20	CHIP COIL	CDRH62 22µH
L 910	351P160O30	CHIP COIL	CDRH62 33µH
		TRANSFORMERS	
T 901	409P886O10	CHIP TRANSFORMER	CLQ72-MZ002
		RESISTORS	
R 2AA	103P501O30	CHIP RESISTOR	1/16W 100Ω-J
R 2AB	103P501O30	CHIP RESISTOR	1/16W 100Ω-J

SYMBOL No.	PARTS No.	PARTS NAME	DESCRIPTION
R 2AC	103P502O90	CHIP RESISTOR	1/16W 2.2kΩ-J
R 2AD	103P509O50	CHIP RESISTOR	0Ω(RM1608)
R 2AE	103P509O50	CHIP RESISTOR	0Ω(RM1608)
R 2AF	103P509O50	CHIP RESISTOR	0Ω(RM1608)
R 2AG	103P504O90	CHIP RESISTOR	1/16W 100kΩ-J
R 2AH	103P506O10	CHIP RESISTOR	1/16W 1MΩ-J
R 2AJ	103P504O90	CHIP RESISTOR	1/16W 100kΩ-J
R 301	103P509O50	CHIP RESISTOR	0Ω(RM1608)
R 302	103P503O70	CHIP RESISTOR	1/16W 10kΩ-J
R 303	103P504O50	CHIP RESISTOR	1/16W 47kΩ-J
R 304	103P504O30	CHIP RESISTOR	1/16W 33kΩ-J
R 305	103P504O90	CHIP RESISTOR	1/16W 100kΩ-J
R 306	103P509O50	CHIP RESISTOR	0Ω(RM1608)
R 307	103P509O50	CHIP RESISTOR	0Ω(RM1608)
R 308	103P509O50	CHIP RESISTOR	0Ω(RM1608)
R 309	103P495O80	CHIP METAL RESISTOR	1/16W 24kΩ-F
R 310	103P495O40	CHIP METAL RESISTOR	1/16W 16kΩ-F
R 311	103P495O30	CHIP METAL RESISTOR	1/16W 15kΩ-F
R 312	103P509O50	CHIP RESISTOR	0Ω(RM1608)
R 313	103P501O10	CHIP RESISTOR	1/16W 68Ω-J
R 314	103P504O50	CHIP RESISTOR	1/16W 47kΩ-J
R 315	103P504O40	CHIP RESISTOR	1/16W 39kΩ-J
R 316	103P504O50	CHIP RESISTOR	1/16W 47kΩ-J
R 317	103P501O30	CHIP RESISTOR	1/16W 100Ω-J
R 318	103P506O10	CHIP RESISTOR	1/16W 1MΩ-J
R 319	103P509O50	CHIP RESISTOR	0Ω(RM1608)
R 320	103P509O50	CHIP RESISTOR	0Ω(RM1608)
R 322	103P500O10	CHIP RESISTOR	1/16W 10Ω-J
R 323	103P493O70	CHIP METAL RESISTOR	1/16W 3.3kΩ-F
R 324	103P493O70	CHIP METAL RESISTOR	1/16W 3.3kΩ-F
R 325	103P500O10	CHIP RESISTOR	1/16W 10Ω-J
R 326	103P502O50	CHIP RESISTOR	1/16W 1kΩ-J
R 327	103P502O50	CHIP RESISTOR	1/16W 1kΩ-J
R 328	103P490O80	CHIP METAL RESISTOR	1/16W 200Ω-F
R 329	103P502O90	CHIP RESISTOR	1/16W 2.2kΩ-J
R 330	103P506O10	CHIP RESISTOR	1/16W 1MΩ-J
R 331	103P503O10	CHIP RESISTOR	1/16W 3.3kΩ-J
R 332	103P490O80	CHIP METAL RESISTOR	1/16W 200Ω-F
R 333	103P503O30	CHIP RESISTOR	1/16W 4.7kΩ-J
R 334	103P502O60	CHIP RESISTOR	1/16W 1.2kΩ-J
R 335	103P503O30	CHIP RESISTOR	1/16W 4.7kΩ-J
R 336	103P502O50	CHIP RESISTOR	1/16W 1kΩ-J
R 337	103P501O10	CHIP RESISTOR	1/16W 68Ω-J
R 338	103P501O10	CHIP RESISTOR	1/16W 68Ω-J
R 339	103P504O10	CHIP RESISTOR	1/16W 22kΩ-J
R 340	103P504O10	CHIP RESISTOR	1/16W 22kΩ-J
R 341	103P501O10	CHIP RESISTOR	1/16W 68Ω-J
R 342	103P504O10	CHIP RESISTOR	1/16W 22kΩ-J
R 344	103P502O90	CHIP RESISTOR	1/16W 2.2kΩ-J
R 345	103P503O00	CHIP RESISTOR	1/16W 2.7kΩ-J
R 346	103P504O50	CHIP RESISTOR	1/16W 47kΩ-J
R 347	103P502O50	CHIP RESISTOR	1/16W 1kΩ-J
R 401	103P504O50	CHIP RESISTOR	1/16W 47kΩ-J
R 402	103P504O50	CHIP RESISTOR	1/16W 47kΩ-J
R 404	103P509O50	CHIP RESISTOR	0Ω(RM1608)
R 405	103P504O50	CHIP RESISTOR	1/16W 47kΩ-J
R 406	103P504O50	CHIP RESISTOR	1/16W 47kΩ-J

SYMBOL No.	PARTS No.	PARTS NAME	DESCRIPTION
R 407	103P503O30	CHIP RESISTOR	1/16W 4.7kΩ-J
R 408	103P502O50	CHIP RESISTOR	1/16W 1kΩ-J
R 409	103P502O50	CHIP RESISTOR	1/16W 1kΩ-J
R 410	103P502O50	CHIP RESISTOR	1/16W 1kΩ-J
R 411	103P504O50	CHIP RESISTOR	1/16W 47kΩ-J
R 412	103P504O50	CHIP RESISTOR	1/16W 47kΩ-J
R 413	103P504O50	CHIP RESISTOR	1/16W 47kΩ-J
R 414	103P504O50	CHIP RESISTOR	1/16W 47kΩ-J
R 415	103P504O50	CHIP RESISTOR	1/16W 47kΩ-J
R 416	103P504O50	CHIP RESISTOR	1/16W 47kΩ-J
R 417	103P504O50	CHIP RESISTOR	1/16W 47kΩ-J
R 418	103P501O70	CHIP RESISTOR	1/16W 220Ω-J
R 419	103P504O50	CHIP RESISTOR	1/16W 47kΩ-J
R 421	103P504O50	CHIP RESISTOR	1/16W 47kΩ-J
R 422	103P504O50	CHIP RESISTOR	1/16W 47kΩ-J
R 423	103P504O50	CHIP RESISTOR	1/16W 47kΩ-J
R 424	103P502O30	CHIP RESISTOR	1/16W 680Ω-J
R 425	103P502O30	CHIP RESISTOR	1/16W 680Ω-J
R 426	103P502O30	CHIP RESISTOR	1/16W 680Ω-J
R 427	103P502O30	CHIP RESISTOR	1/16W 680Ω-J
R 428	103P502O30	CHIP RESISTOR	1/16W 680Ω-J
R 429	103P502O30	CHIP RESISTOR	1/16W 680Ω-J
R 430	103P509O50	CHIP RESISTOR	0Ω(RM1608)
R 432	103P509O50	CHIP RESISTOR	0Ω(RM1608)
R 433	103P500O50	CHIP RESISTOR	1/16W 22Ω-J
R 434	103P500O50	CHIP RESISTOR	1/16W 22Ω-J
R 435	103P503O70	CHIP RESISTOR	1/16W 10kΩ-J
R 436	103P504O50	CHIP RESISTOR	1/16W 47kΩ-J
R 438	103P504O50	CHIP RESISTOR	1/16W 47kΩ-J
R 439	103P504O50	CHIP RESISTOR	1/16W 47kΩ-J
R 501	103P501O30	CHIP RESISTOR	1/16W 100Ω-J
R 502	103P504O50	CHIP RESISTOR	1/16W 47kΩ-J
R 503	103P504O50	CHIP RESISTOR	1/16W 47kΩ-J
R 504	103P508O60	CHIP METAL RESISTOR	1/16W 3.3Ω-J
R 505	103P508O60	CHIP METAL RESISTOR	1/16W 3.3Ω-J
R 506	103P508O60	CHIP METAL RESISTOR	1/16W 3.3Ω-J
R 507	103P508O60	CHIP METAL RESISTOR	1/16W 3.3Ω-J
R 508	103P501O70	CHIP RESISTOR	1/16W 220Ω-J
R 509	103P504O10	CHIP RESISTOR	1/16W 22kΩ-J
R 510	103P503O30	CHIP RESISTOR	1/16W 4.7kΩ-J
R 511	103P502O50	CHIP RESISTOR	1/16W 1kΩ-J
R 512	103P501O30	CHIP RESISTOR	1/16W 100Ω-J
R 513	103P493O20	CHIP METAL RESISTOR	1/16W 2kΩ-F
R 514	103P503O70	CHIP RESISTOR	1/16W 10kΩ-J
R 515	103P503O70	CHIP RESISTOR	1/16W 10kΩ-J
R 516	103P504O90	CHIP RESISTOR	1/16W 100kΩ-J
R 517	103P503O70	CHIP RESISTOR	1/16W 10kΩ-J
R 518	103P503O00	CHIP RESISTOR	1/16W 2.7kΩ-J
R 519	103P506O00	CHIP RESISTOR	1/16W 820kΩ-J
R 520	103P505O70	CHIP RESISTOR	1/16W 470kΩ-J
R 521	103P504O30	CHIP RESISTOR	1/16W 33kΩ-J
R 522	103P503O80	CHIP RESISTOR	1/16W 12kΩ-J
R 523	103P503O80	CHIP RESISTOR	1/16W 12kΩ-J
R 524	103P504O90	CHIP RESISTOR	1/16W 100kΩ-J
R 525	103P503O90	CHIP RESISTOR	1/16W 15kΩ-J
R 526	103P505O30	CHIP RESISTOR	1/16W 220kΩ-J

SYMBOL No.	PARTS No.	PARTS NAME	DESCRIPTION
R 527	103P504O00	CHIP RESISTOR	1/16W 18kΩ-J
R 528	103P504O10	CHIP RESISTOR	1/16W 22kΩ-J
R 529	103P504O20	CHIP RESISTOR	1/16W 27kΩ-J
R 530	103P504O50	CHIP RESISTOR	1/16W 47kΩ-J
R 531	103P503O70	CHIP RESISTOR	1/16W 10kΩ-J
R 532	103P504O50	CHIP RESISTOR	1/16W 47kΩ-J
R 533	103P509O50	CHIP RESISTOR	0Ω(RM1608)
R 534	103P504O50	CHIP RESISTOR	1/16W 47kΩ-J
R 535	103P504O50	CHIP RESISTOR	1/16W 47kΩ-J
R 536	103P504O50	CHIP RESISTOR	1/16W 47kΩ-J
R 537	103P509O50	CHIP RESISTOR	0Ω(RM1608)
R 539	103P509O50	CHIP RESISTOR	0Ω(RM1608)
R 541	103P509O50	CHIP RESISTOR	0Ω(RM1608)
R 542	103P504O50	CHIP RESISTOR	1/16W 47kΩ-J
R 543	103P503O30	CHIP RESISTOR	1/16W 4.7kΩ-J
R 545	103P509O50	CHIP RESISTOR	0Ω(RM1608)
R 546	103P503O30	CHIP RESISTOR	1/16W 4.7kΩ-J
R 547	103P501O30	CHIP RESISTOR	1/16W 100Ω-J
R 548	103P503O30	CHIP RESISTOR	1/16W 4.7kΩ-J
R 549	103P502O60	CHIP RESISTOR	1/16W 1.2kΩ-J
R 550	103P504O60	CHIP RESISTOR	1/16W 56kΩ-J
R 551	103P502O50	CHIP RESISTOR	1/16W 1kΩ-J
R 552	103P504O10	CHIP RESISTOR	1/16W 22kΩ-J
R 553	103P504O10	CHIP RESISTOR	1/16W 22kΩ-J
R 554	103P505O50	CHIP RESISTOR	1/16W 330kΩ-J
R 555	103P506O50	CHIP RESISTOR	1/16W 2.2MΩ-K
R 601	103P503O50	CHIP RESISTOR	1/16W 6.8kΩ-J
R 602	103P505O30	CHIP RESISTOR	1/16W 220kΩ-J
R 604	103P501O10	CHIP RESISTOR	1/16W 68Ω-J
R 605	103P503O20	CHIP RESISTOR	1/16W 3.9kΩ-J
R 608	103P501O70	CHIP RESISTOR	1/16W 220Ω-J
R 609	103P502O30	CHIP RESISTOR	1/16W 680Ω-J
R 610	103P501O70	CHIP RESISTOR	1/16W 220Ω-J
R 611	103P502O10	CHIP RESISTOR	1/16W 470Ω-J
R 612	103P503O90	CHIP RESISTOR	1/16W 15kΩ-J
R 613	103P496O00	CHIP METAL RESISTOR	1/16W 30kΩ-F
R 614	103P493O80	CHIP METAL RESISTOR	1/16W 3.6kΩ-F
R 615	103P502O50	CHIP RESISTOR	1/16W 1kΩ-J
R 616	103P504O30	CHIP RESISTOR	1/16W 33kΩ-J
R 617	103P504O30	CHIP RESISTOR	1/16W 33kΩ-J
R 618	103P502O80	CHIP RESISTOR	1/16W 2.7kΩ-J
R 619	103P504O90	CHIP RESISTOR	1/16W 100kΩ-J
R 620	103P503O20	CHIP RESISTOR	1/16W 3.9kΩ-J
R 621	103P494O70	CHIP METAL RESISTOR	1/16W 8.2kΩ-F
R 622	103P491O70	CHIP METAL RESISTOR	1/16W 470Ω-F
R 623	103P494O70	CHIP METAL RESISTOR	1/16W 8.2kΩ-F
R 624	103P502O50	CHIP RESISTOR	1/16W 1kΩ-J
R 625	103P502O50	CHIP RESISTOR	1/16W 1kΩ-J
R 801	103P509O90	CHIP RESISTOR	1/16W 75Ω-J
R 802	103P503O70	CHIP RESISTOR	1/16W 10kΩ-J
R 803	103P503O70	CHIP RESISTOR	1/16W 10kΩ-J
R 804	103P503O70	CHIP RESISTOR	1/16W 10kΩ-J
R 805	103P503O70	CHIP RESISTOR	1/16W 10kΩ-J
R 806	103P503O70	CHIP RESISTOR	1/16W 10kΩ-J
R 807	103P503O70	CHIP RESISTOR	1/16W 10kΩ-J
R 808	103P503O70	CHIP RESISTOR	1/16W 10kΩ-J
R 809	103P503O70	CHIP RESISTOR	1/16W 10kΩ-J
R 810	103P503O70	CHIP RESISTOR	1/16W 10kΩ-J
R 811	103P503O70	CHIP RESISTOR	1/16W 10kΩ-J
R 812	103P503O70	CHIP RESISTOR	1/16W 10kΩ-J
R 813	103P504O90	CHIP RESISTOR	1/16W 100kΩ-J
R 901	103P495O30	CHIP METAL RESISTOR	1/16W 15kΩ-F
R 902	103P496O90	CHIP METAL RESISTOR	1/6W 68kΩ-F
R 903	103P494O70	CHIP METAL RESISTOR	1/16W 8.2kΩ-F
R 904	103P495O30	CHIP METAL RESISTOR	1/16W 15kΩ-F
R 905	103P495O30	CHIP METAL RESISTOR	1/16W 15kΩ-F
R 906	103P495O10	CHIP METAL RESISTOR	1/16W 12kΩ-F
R 907	103P504O90	CHIP RESISTOR	1/16W 100kΩ-J
R 908	103P503O80	CHIP RESISTOR	1/16W 12kΩ-J
R 909	103P503O40	CHIP RESISTOR	1/16W 5.6kΩ-J
R 910	103P505O10	CHIP RESISTOR	1/16W 150kΩ-J
R 911	103P503O60	CHIP RESISTOR	1/16W 8.2kΩ-J
R 912	103P509O50	CHIP RESISTOR	0Ω(RM1608)
R 913	103P504O60	CHIP RESISTOR	1/16W 56kΩ-J
R 914	103P504O10	CHIP RESISTOR	1/16W 22kΩ-J
R 915	103P504O10	CHIP RESISTOR	1/16W 22kΩ-J
R 916	103P494O00	CHIP METAL RESISTOR	1/16W 4.3kΩ-F
R 917	103P504O50	CHIP RESISTOR	1/16W 47kΩ-J
R 918	103P495O40	CHIP METAL RESISTOR	1/16W 16kΩ-F
R 919	103P503O60	CHIP RESISTOR	1/16W 8.2kΩ-J
R 920	103P496O30	CHIP RESISTOR	1/16W 39kΩ-F
R 921	103P494O30	CHIP METAL RESISTOR	1/16W 5.6kΩ-F
R 922	103P502O30	CHIP RESISTOR	1/16W 680Ω-J
R 923	103P495O30	CHIP METAL RESISTOR	1/16W 15kΩ-F
R 924	103P491O40	CHIP METAL RESISTOR	1/16W 360Ω-F
R 925	103P502O10	CHIP RESISTOR	1/16W 470Ω-J
R 926	103P502O10	CHIP RESISTOR	1/16W 470Ω-J
R 927	103P502O10	CHIP RESISTOR	1/16W 470Ω-J
R 928	103P503O20	CHIP RESISTOR	1/16W 3.9kΩ-J
R 929	103P503O90	CHIP RESISTOR	1/16W 15kΩ-J
R 930	103P401O60	CHIP RESISTOR	1/10W 180Ω-J
R 931	103P502O50	CHIP RESISTOR	1/16W 1kΩ-J
R 932	103P504O50	CHIP RESISTOR	1/16W 47kΩ-J
R 933	103P493O80	CHIP METAL RESISTOR	1/16W 3.6kΩ-F
R 934	103P502O10	CHIP RESISTOR	1/16W 470Ω-J
R 935	103P504O10	CHIP RESISTOR	1/16W 22kΩ-J
		CAPACITORS AND TRIMMERS	
C 2AA	141P144O20	CHIP CAPACITOR	F16V 0.1μF-Z
C 2AB	141P143O80	CHIP CAPACITOR	F50V 0.01μF-Z
C 2AC	141P141O30	CHIP CAPACITOR	B50V 2200pF-K
C 2AD	141P144O20	CHIP CAPACITOR	F16V 0.1μF-Z
C 2AE	141P135O70	CHIP CAPACITOR	F16V 1μF-Z
C 301	141P143O80	CHIP CAPACITOR	F50V 0.01μF-Z
C 302	141P135O70	CHIP CAPACITOR	F16V 1μF-Z
C 303	154P341O90	CHIP CAPACITOR	CH50V 22pF-J
C 304	141P140O90	CHIP CAPACITOR	B50V 1000pF-K
C 305	141P140O90	CHIP CAPACITOR	B50V 1000pF-K
C 306	189P125O40	CHIP CAPACITOR	25V 1.5μF-M
C 307	141P143O80	CHIP CAPACITOR	F50V 0.01μF-Z
C 308	141P143O80	CHIP CAPACITOR	F50V 0.01μF-Z
C 309	189P123O40	CHIP TANTAL-C	16V 3.3μF-M
C 310	189P122O30	CHIP TANTAL-C	10V 4.7μF-M

SYMBOL No.	PARTS No.	PARTS NAME	DESCRIPTION
C 311	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 312	189P122030	CHIP TANTAL-C	10V 4.7μF-M
C 313	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 315	154P341090	CHIP CAPACITOR	CH50V 22pF-J
C 316	189P123010	CHIP TANTAL-C	16V 1μF-M
C 317	189P123010	CHIP TANTAL-C	16V 1μF-M
C 318	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 319	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 320	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 321	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 322	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 323	189P122030	CHIP TANTAL-C	10V 4.7μF-M
C 324	141P143080	CHIP CAPACITOR	F50V 0.01μF-Z
C 325	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 326	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 327	189P122030	CHIP TANTAL-C	10V 4.7μF-M
C 328	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 329	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 330	189P122010	CHIP TANTAL-C	10V 2.2μF-M
C 331	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 332	189P122010	CHIP TANTAL-C	10V 2.2μF-M
C 333	189P122030	CHIP TANTAL-C	10V 4.7μF-M
C 334	141P143080	CHIP CAPACITOR	F50V 0.01μF-Z
C 335	189P122030	CHIP TANTAL-C	10V 4.7μF-M
C 336	141P143080	CHIP CAPACITOR	F50V 0.01μF-Z
C 337	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 338	141P140090	CHIP CAPACITOR	B50V 1000pF-K
C 339	154P340050	CHIP CAPACITOR	CH50V 4pF-C
C 340	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 341	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 342	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 343	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 345	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 346	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 347	154P341070	CHIP CAPACITOR	CH50V 18pF-J
C 348	141P143080	CHIP CAPACITOR	F50V 0.01μF-Z
C 349	141P143080	CHIP CAPACITOR	F50V 0.01μF-Z
C 350	141P135070	CHIP CAPACITOR	F16V 1μF-Z
C 351	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 352	189P122030	CHIP TANTAL-C	10V 4.7μF-M
C 353	189P123070	CHIP TANTAL-C	16V 10μF-M
C 354	181P520040	CHIP ELECTROLYTIC-C	6.3V 100μF-M
C 359	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 360	141P135070	CHIP CAPACITOR	F16V 1μF-Z
C 363	181P515000	CHIP ELECTROLYTIC-C	NP35V 10μF-M
C 364	189P122010	CHIP TANTAL-C	10V 2.2μF-M
C 365	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 401	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 402	189P122030	CHIP TANTAL-C	10V 4.7μF-M
C 403	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 404	189P122030	CHIP TANTAL-C	10V 4.7μF-M
C 405	141P143080	CHIP CAPACITOR	F50V 0.01μF-Z
C 406	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 407	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 408	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 409	141P144000	CHIP CAPACITOR	F25V 0.033μF-Z
C 410	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z

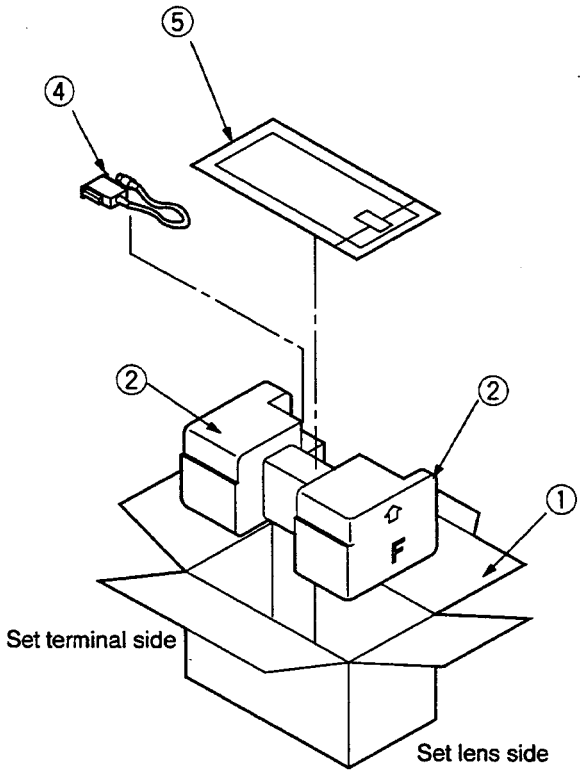
SYMBOL No.	PARTS No.	PARTS NAME	DESCRIPTION
C 411	189P122030	CHIP TANTAL-C	10V 4.7μF-M
C 412	141P136060	CHIP CAPACITOR	F16V 4.7μF-Z
C 413	141P136060	CHIP CAPACITOR	F16V 4.7μF-Z
C 414	141P136060	CHIP CAPACITOR	F16V 4.7μF-Z
C 415	189P122030	CHIP TANTAL-C	10V 4.7μF-M
C 416	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 417	141P136060	CHIP CAPACITOR	F16V 4.7μF-Z
C 501	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 502	189P123040	CHIP TANTAL-C	16V 3.3μF-M
C 503	141P141050	CHIP CAPACITOR	B50V 3300pF-K
C 504	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 505	189P122030	CHIP TANTAL-C	10V 4.7μF-M
C 506	141P141050	CHIP CAPACITOR	B50V 3300pF-K
C 507	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 508	189P122030	CHIP TANTAL-C	10V 4.7μF-M
C 509	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 510	141P139030	CHIP CAPACITOR	B25V 0.1μF-K
C 511	141P135070	CHIP CAPACITOR	F16V 1μF-Z
C 512	141P140090	CHIP CAPACITOR	B50V 1000pF-K
C 513	141P140090	CHIP CAPACITOR	B50V 1000pF-K
C 514	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 515	189P122030	CHIP TANTAL-C	10V 4.7μF-M
C 516	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 517	189P122030	CHIP TANTAL-C	10V 4.7μF-M
C 518	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 519	189P122030	CHIP TANTAL-C	10V 4.7μF-M
C 520	141P135070	CHIP CAPACITOR	F16V 1μF-Z
C 521	141P135070	CHIP CAPACITOR	F16V 1μF-Z
C 522	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 523	189P122010	CHIP TANTAL-C	10V 2.2μF-M
C 524	189P122010	CHIP TANTAL-C	10V 2.2μF-M
C 525	141P135070	CHIP CAPACITOR	F16V 1μF-Z
C 526	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 601	181P510030	CHIP ELECTROLYTIC-C	NP6.3V 47μF-M
C 602	181P510030	CHIP ELECTROLYTIC-C	NP6.3V 47μF-M
C 603	181P510030	CHIP ELECTROLYTIC-C	NP6.3V 47μF-M
C 604	141P135080	CHIP CAPACITOR	F25V 0.1μF-Z
C 605	141P135070	CHIP CAPACITOR	F16V 1μF-Z
C 606	141P135070	CHIP CAPACITOR	F16V 1μF-Z
C 607	154P326000	CHIP CAPACITOR	SL50V 1000pF-J
C 608	181P522060	CHIP ELECTROLYTIC-C	16V 47μF-M
C 609	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 610	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 611	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 612	181P515000	CHIP ELECTROLYTIC-C	NP35V 10μF-M
C 613	154P343030	CHIP CAPACITOR	CH50V 82pF-J
C 614	141P135070	CHIP CAPACITOR	F16V 1μF-Z
C 615	141P135070	CHIP CAPACITOR	F16V 1μF-Z
C 616	141P144000	CHIP CAPACITOR	F25V 0.033μF-Z
C 617	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 618	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 619	189P123040	CHIP TANTAL-C	16V 3.3μF-M
C 620	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 801	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 802	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z
C 803	141P142050	CHIP CAPACITOR	B25V/16V 0.022μF-K
C 901	141P144020	CHIP CAPACITOR	F16V 0.1μF-Z

⚠ : Critical Components

SYMBOL No.	PARTS No.	PARTS NAME	DESCRIPTION
C 902	141P131O50	CHIP CAPACITOR	B50V 3300pF-K
C 903	154P345O10	CHIP CAPACITOR	CH25V 470pF-J
C 904	141P144O20	CHIP CAPACITOR	F16V 0.1μF-Z
C 905	141P131O00	CHIP CAPACITOR	B50V 1200pF-K
C 906	154P345O10	CHIP CAPACITOR	CH25V 470pF-J
C 907	141P140O90	CHIP CAPACITOR	B50V 1000pF-K
C 908	141P144O20	CHIP CAPACITOR	F16V 0.1μF-Z
C 909	141P131O10	CHIP CAPACITOR	B50V 1500pF-K
C 910	141P137O40	CHIP CAPACITOR	B25V 0.022μF-K
C 911	154P345O10	CHIP CAPACITOR	CH25V 470pF-J
C 912	154P345O10	CHIP CAPACITOR	CH25V 470pF-J
C 914	154P345O50	CHIP CAPACITOR	CH25V 680pF-J
C 915	154P345O10	CHIP CAPACITOR	CH25V 470pF-J
C 916	154P345O50	CHIP CAPACITOR	CH25V 680pF-J
C 917	154P345O50	CHIP CAPACITOR	CH25V 680pF-J
C 918	181P502O60	CHIP ELECTROLYTIC-C	16V 47μF-M
C 919	189P125O40	CHIP CAPACITOR	25V 1.5μF-M
C 922	141P136O40	CHIP CAPACITOR	F16V 2.2μF-Z
C 923	141P135O70	CHIP CAPACITOR	F16V 1μF-Z
C 924	141P136O40	CHIP CAPACITOR	F16V 2.2μF-Z
C 926	141P137O80	CHIP CAPACITOR	B25V 0.047μF-K
C 927	141P136O40	CHIP CAPACITOR	F16V 2.2μF-Z
C 928	141P136O60	CHIP CAPACITOR	F16V 4.7μF-Z
C 929	141P136O60	CHIP CAPACITOR	F16V 4.7μF-Z
C 932	141P136O40	CHIP CAPACITOR	F16V 2.2μF-Z
VC301	202P220O30	CHIP C-TRIMMER	7pF-30pF
VC302	202P220O30	CHIP C-TRIMMER	7pF-30pF
		SWITCHES	
S 801	432P100O40	KEY BOARD SWITCH	SET
S 802	432P100O40	KEY BOARD SWITCH	UP
S 803	432P100O40	KEY BOARD SWITCH	DOWN
S 804	431C112O10	SLIDE SWITCH	MODE SWITCH
		MISCELLANEOUS	
	490P177O10	LENS UNIT	Z47
J 801	449C112O10	DIN SOCKET	4PIN
J 802	449C140O10	DIN SOCKET	8PIN
J 803	452D240O10	BNC CONNECTOR	
J 804	452D240O10	BNC CONNECTOR	
J 805	451C158O10	POWER JACK	
TP6R8V	299P136O90	CHIP CHECKER	1608
TPALC	299P136O90	CHIP CHECKER	1608
TPADCK	299P136O90	CHIP CHECKER	1608
TPFNO	299P136O90	CHIP CHECKER	1608
TPFSCO	299P136O90	CHIP CHECKER	1608
TPGND	299P136O90	CHIP CHECKER	1608
TPIRIS	299P136O90	CHIP CHECKER	1608
TPLS06	299P136O90	CHIP CHECKER	1608
TPLS0E	299P136O90	CHIP CHECKER	1608
TPPLL	299P136O90	CHIP CHECKER	1608
TPSEL	299P136O90	CHIP CHECKER	1608
TPVDO	299P136O90	CHIP CHECKER	1608
TPVRFH	299P136O90	CHIP CHECKER	1608
TPVRFL	299P136O90	CHIP CHECKER	1608
X 301	285P322O10	CRYSTAL RESONATOR	17.7345MHz

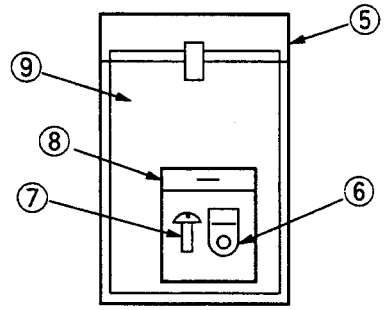
SYMBOL No.	PARTS No.	PARTS NAME	DESCRIPTION
⚠ Z 801	299P137O80	SURGE ABSORBER	0.8A
		PRINTED CIRCUIT BOARD ASSY'S	
⚠	925B043O02	CCD PCB ASSY	
⚠	928D421O02	MAIN PCB ASSY	
⚠	928D422O01	POWER PCB ASSY	
⚠	928D419O02	PS PCB ASSY	
⚠	928D420O02	REAR PCB ASSY	
		MECHANICAL PARTS	
	669D372O10	SCREW	M2X4 D=3.5 BLK
	669D372O20	SCREW	M2X6 D=3.5 BLK
	669D435O20	SCREW	1.7X5 NI
	669D435O50	SCREW	1.7X6 BLK
		COSMETIC PARTS	
	769C006O10	TRIPOD BASE	
	701B377O10	LENS COVER	
	710B036O20	LOWER COVER	
	710C035O10	REAR COVER	
	589D070O60	UPPER COVER	
	734D593O10	SLIDE KNOB	(FOR MODE SW)
	701C074O10	LENS CAP	
	701B376O10	FRONT PANEL	
		PACKING PARTS AND ACCESSORY	
	246C304O10	CABLE	DSUB9P(M)-MINIDIN8P
	540D217O10	CLAMPER	
	803B787O10	CUSHION	
	872C062O30	INSTRUCTION BOOK	ENGLISH
	872C062O40	INSTRUCTION BOOK	GERMAN
	872C062O50	INSTRUCTION BOOK	FRENCH
	801C341O20	PACKING CASE	
	831D252O20	PACKING BAG	110X70X0.06
	831D264O10	PACKING BAG	190X120X0.06
	831D190O40	PACKING SHEET	300X300
	669D171O90	SCREW	M3X6 P=0.5
	859C545O20	JIG	EXTENTION-BB(18P)
	859C545O30	JIG	EXTENTION-BB(26P)
	859C545O60	JIG	EXTENTION-BB(12P)
	859C545O80	JIG	EXTENTION-BB(30P)

PACKING PARTS



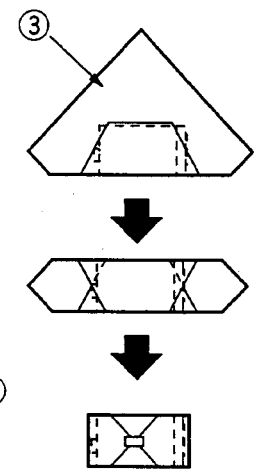
Set the top of the product to the arrow on the PACKING CUSHION.

A model number on the instruction book should be visible from avobe.



How to Set of Packing sheet

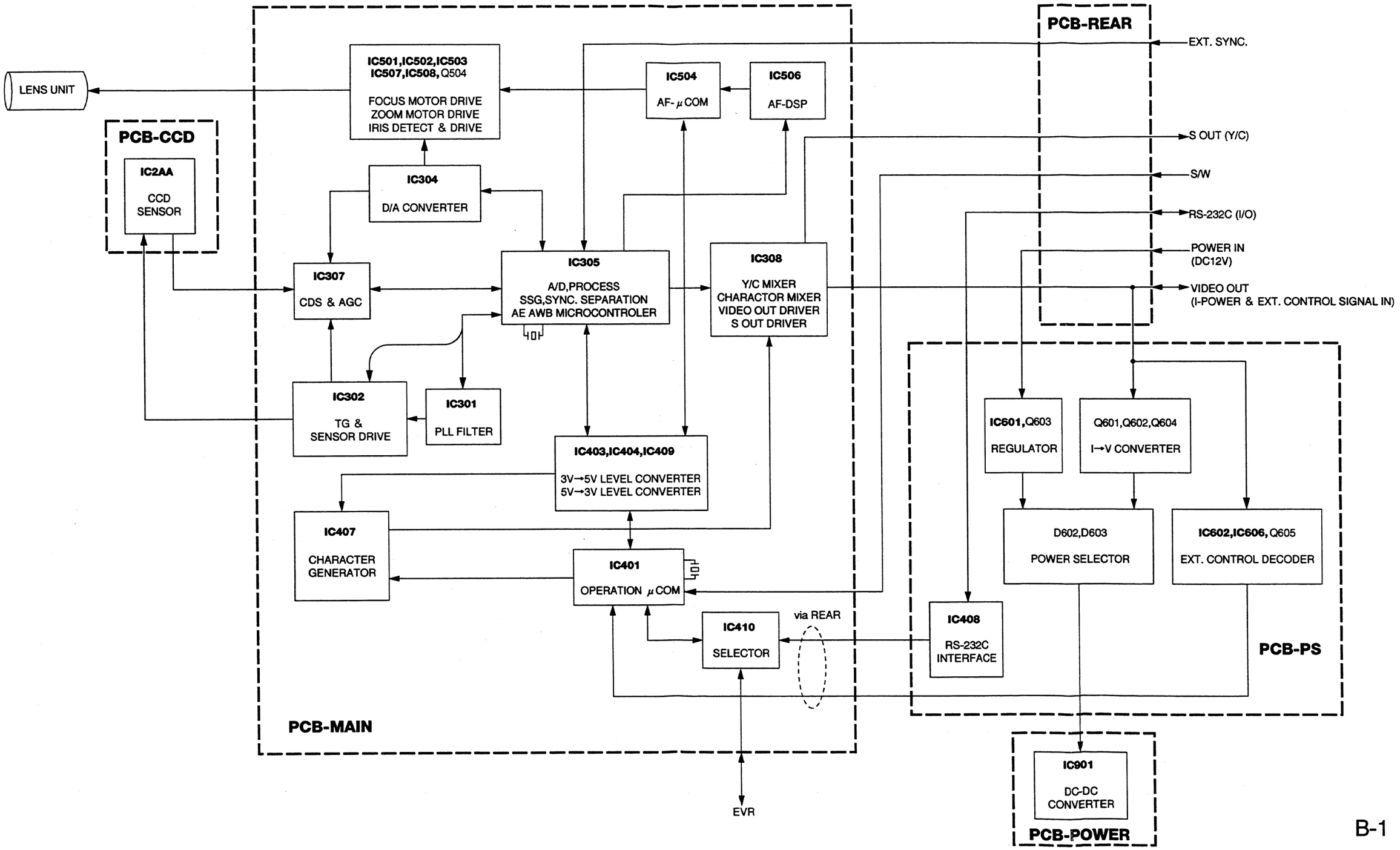
Packing Sheet
Package a product with the glazed side outside.



ITEM NO.	PARTS NO.	PARTS NAME	DESCRIPTION
1	801C341O20	PACKING CASE	
2	803B787O10	CUSHION	
3	831D190O10	PACKING SHEET	300 X 300
4	242C988O10	CABLE	DSUB9P(M)-MINIDIN8P
5	264C304O10	PACKING BAG	190 X 120 X 0.06
6	540D217O10	CLAMPER	
7	669D171O90	SCREW	M3X 6 P=0.5
8	831D252O20	PACKING BAG	110 X 70 X 0.06
9	872C062O60	INSTRUCTION BOOK	ENGLISH
		INSTRUCTION BOOK	GERMAN
		INSTRUCTION BOOK	FRENCH

[MEMO]

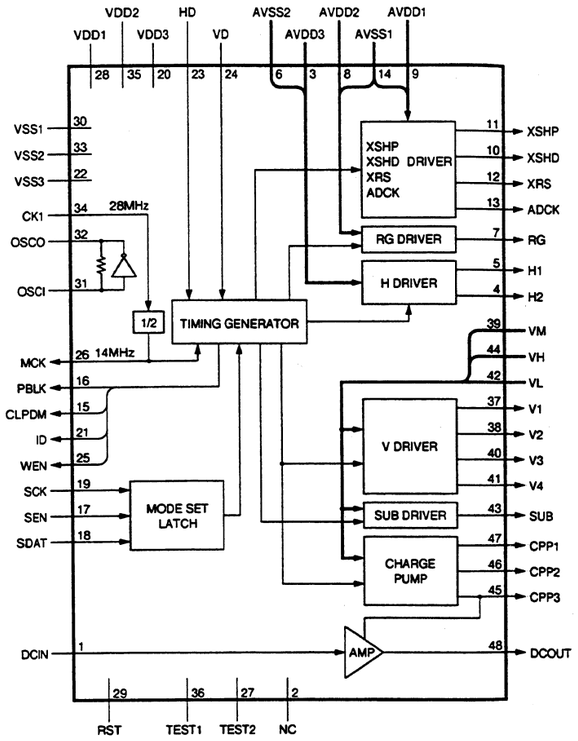
CCD-400/CCD-400E BLOCK DIAGRAM



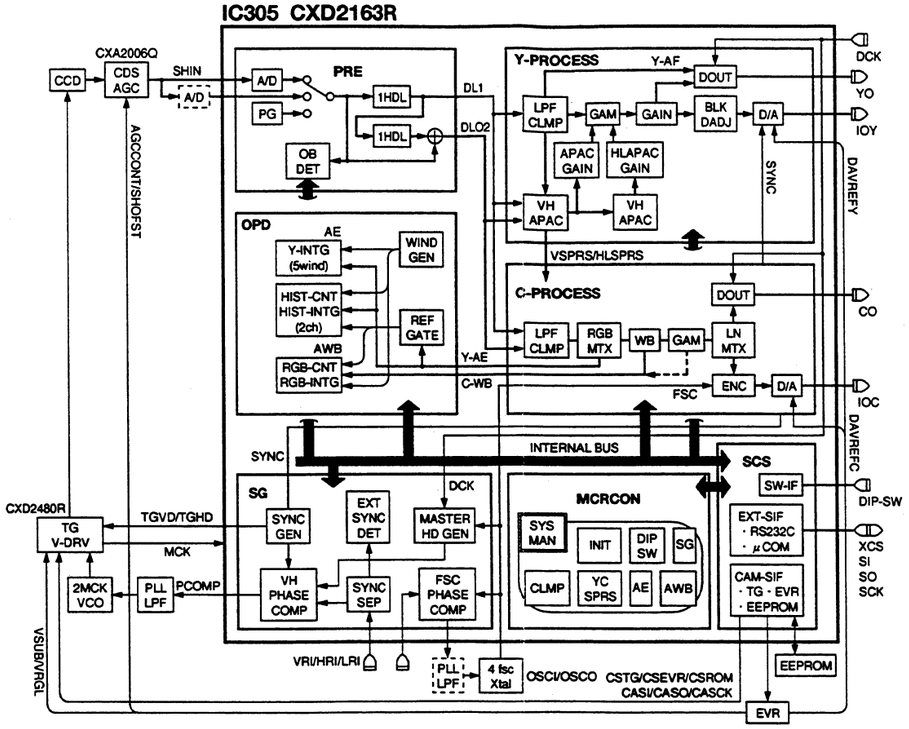
IC BLOCK DIAGRAMS

PCB-MAIN

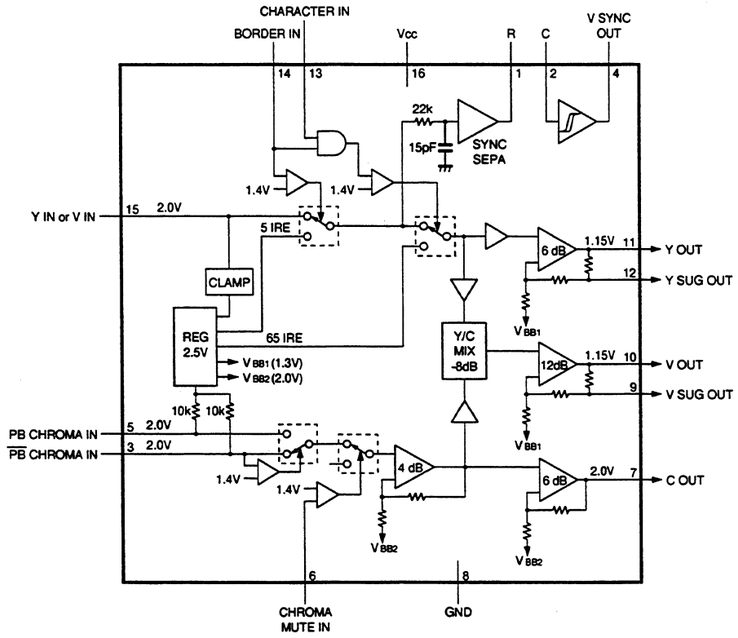
IC302 CXD2480R



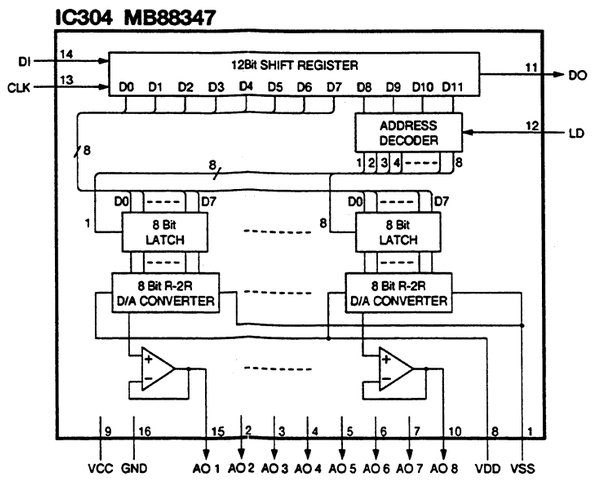
IC305 CXD2163R



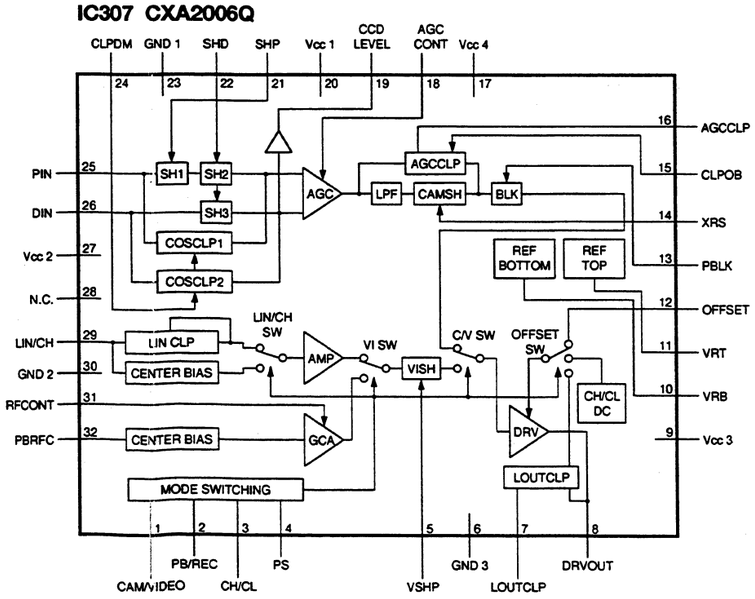
IC308 MM1024AFF



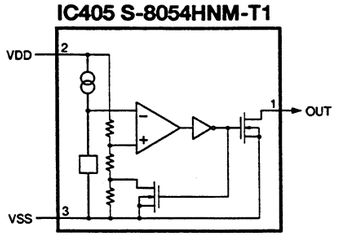
IC304 MB88347



IC307 CXA2006Q

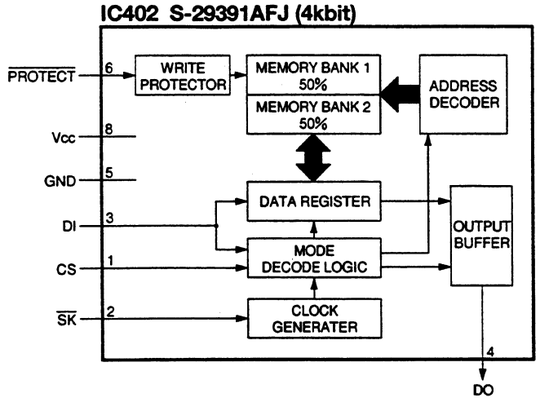


IC405 S-8054HNM-T1

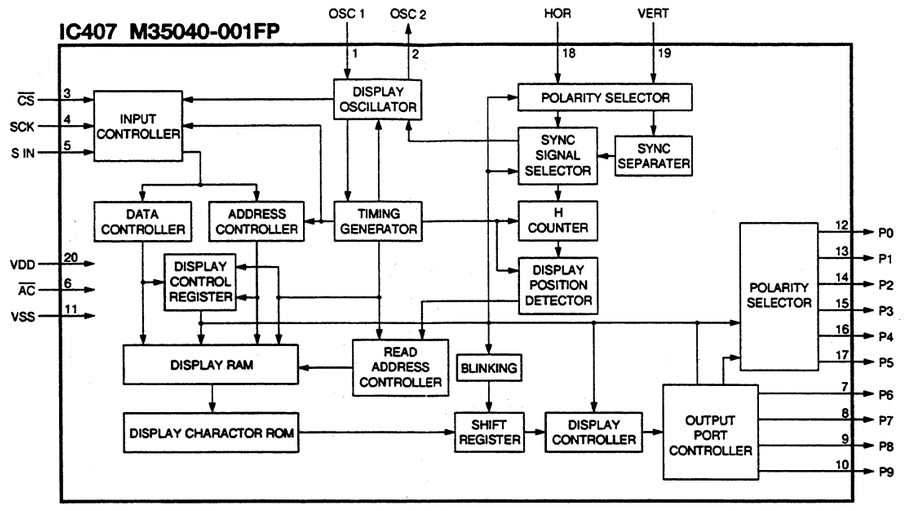


PCB-MAIN

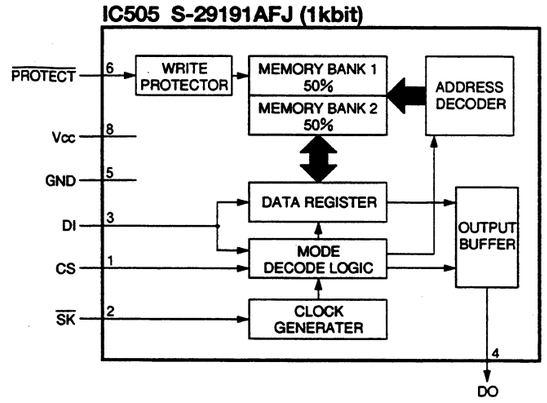
IC402 S-29391AFJ (4kbit)



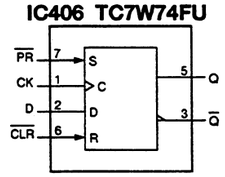
IC407 M35040-001FP



IC505 S-29191AFJ (1kbit)



IC406 TC7W74FU

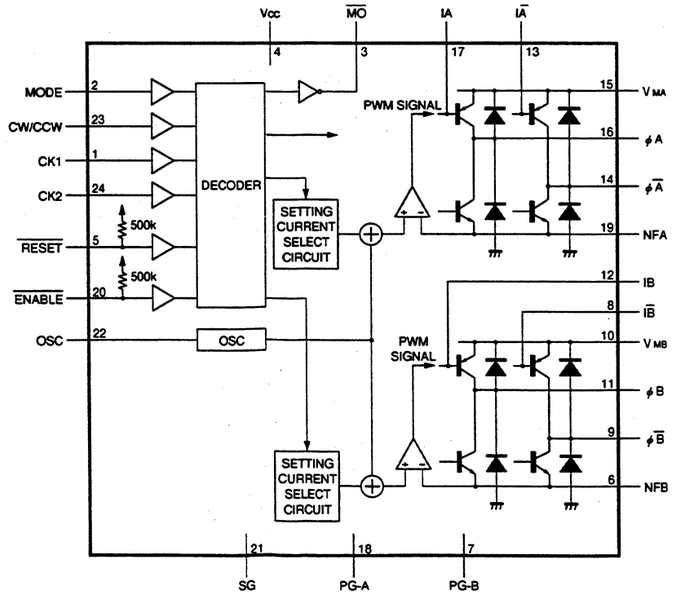


TRUE TABLE

INPUTS				OUTPUTS		FUNCTION
$\overline{CLR}$	$\overline{PR}$	D	CK	Q	$\overline{Q}$	
L	H	×	×	L	H	CLEAR
H	L	×	×	H	L	PRESET
L	L	×	×	H	H	—
H	H	L	↑	L	H	—
H	H	H	↑	H	L	—
H	H	×	↓	Qn	$\overline{Qn}$	NO CHANGE

× : Don't Care

IC501,IC502 TB6512AF



TRUE TABLE A

INPUT					MODE
CK1	CK2	CW/CCW	$\overline{RESET}$	$\overline{ENABLE}$	
↑	H	L	H	L	CW
⊓	L	L	H	L	INHIBIT
H	↑	L	H	L	CCW
L	⊓	L	H	L	INHIBIT
↑	H	H	H	L	CCW
⊓	L	H	H	L	INHIBIT
H	↑	H	H	L	CW
L	⊓	H	H	L	INHIBIT
×	×	×	L	L	INITIAL MODE
×	×	×	×	H	Z

NOTE : Don't use in INHIBIT mode.
Z : HIGH IMPEDANCE
× : Don't Care

TRUE TABLE B

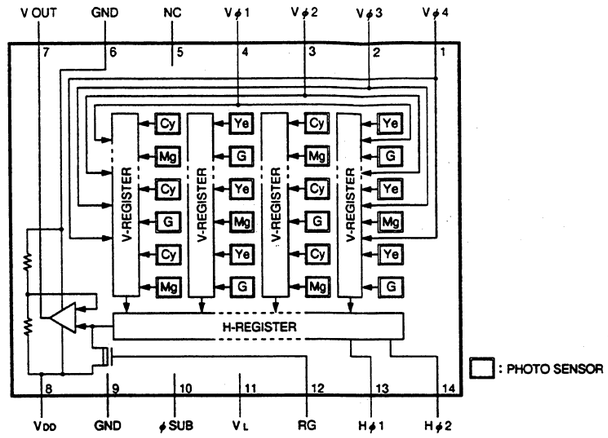
INPUT	MODE (EXCITATION)
MODE	
L	1-2 PHASE
H	2W1-2 PHASE

INITIAL MODE

EXCITATION MODE	PHASE "A" CURRENT	PHASE "B" CURRENT
1-2 PHASE	100%	0%
2W1-2 PHASE	100%	0%

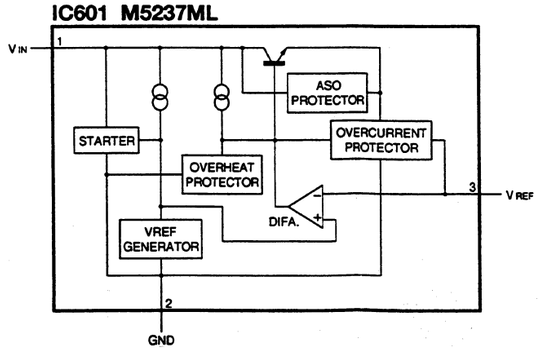
PCB-CCD

IC2AA ICX069AK

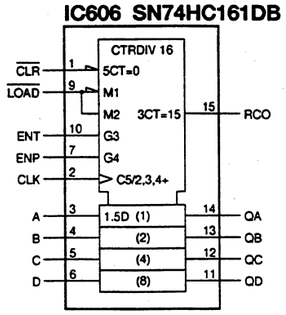


PCB-PS

IC601 M5237ML



IC606 SN74HC161DB



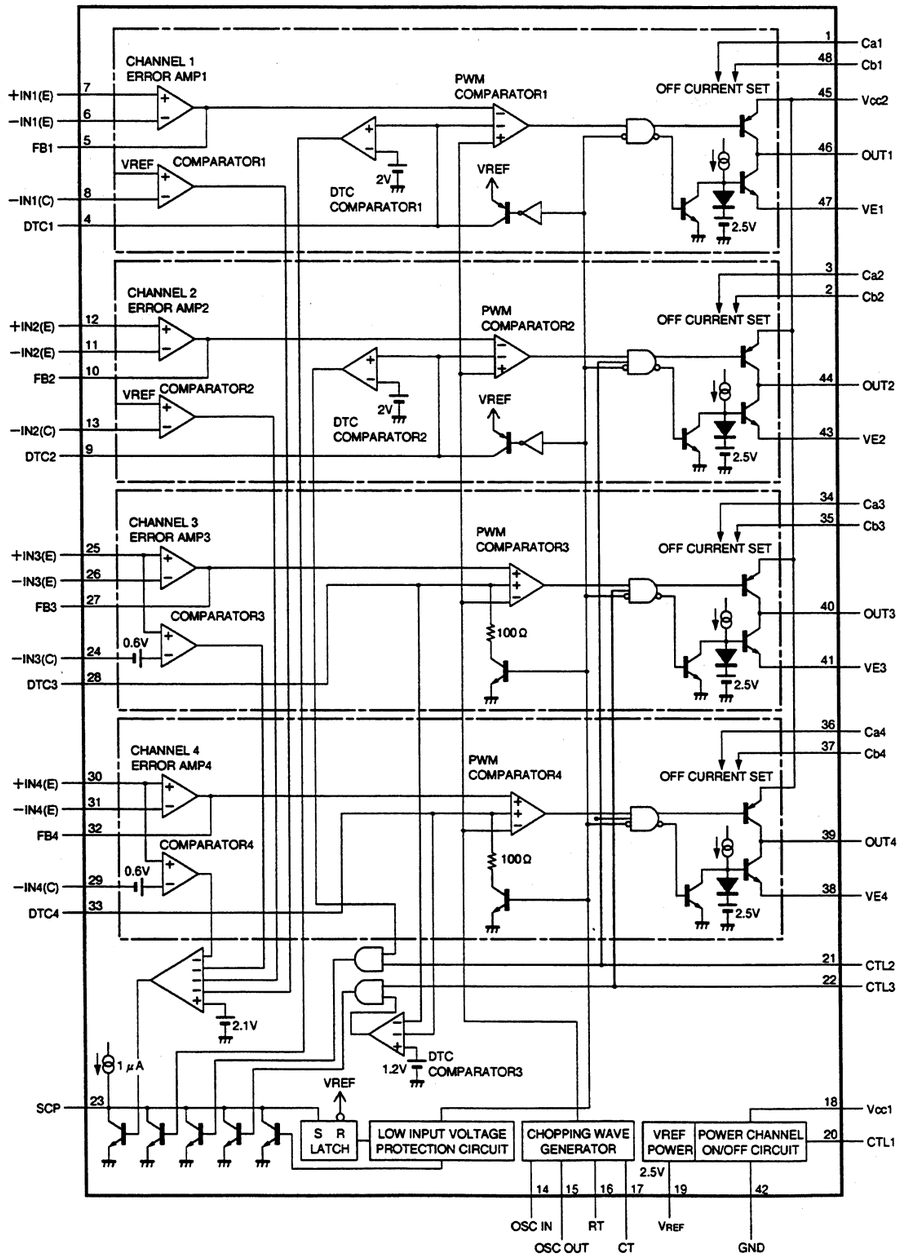
TRUE TABLE

INPUTS					OUTPUTS	
CLK	ENP	ENT	LOAD	CLR	RCO	QA,QB,QC,QD
×	×	×	×	L	L	ALL "L"
↓	×	×	L	H	Effective with ENT="H"	A,B,C,D
↓	H	H	H	H	Effective	Count Up
×	×	L	H	H	L	No Change
×	L	×	H	H	Effective with ENT="H"	

H : High Level
L : Low Level
× : Don't Care

PCB-POWER

IC901 MB3785A



PCB-BLOCK DIAGRAM

⚠ PCB-PS
P. ①

PD: RXD2 TXD2 RXD1 TXD1 GND GND GND GND GND 5V 5V VPS VPS VDS 12V 12V 12V GND GND CD3 CD2 CD1 CD0 GND GND XVD 12VOUT 12VOUT 12VOUT 12VOUT

RD: RXD2 TXD2 RXD1 TXD1 GND GND GND GND GND 5V 5V VPS VPS VDS 12V 12V 12V GND GND CD3 CD2 CD1 CD0 GND GND XVD 12VOUT 12VOUT 12VOUT 12VOUT

⚠ PCB-CCD
P. ①

CA: VOUT VL VDD GND RG H∮1 H∮2 V∮1 V∮2 V∮3 SUB V∮4

MA: VOUT VL VDD GND RG H∮1 H∮2 V∮1 V∮2 V∮3 SUB V∮4

⚠ PCB-REAR
P. ①

J805 POWER
J804 EX-SYNC
J803 VIDEO
J801 S-VIDEO
J802 RS-232C I/O
S804 MODE
S801 SET
S802 ▲
S803 ▼

RD: 12VOUT 12VOUT 12VOUT XVD GND GND GND GND C Y 5V 5V VIDEO EXT-SYNC GND GND KEYIN SWIN DIR 232/X485 TXD2 RXD2 CD0 CD1 CD2 CD3

AB: 12VOUT 12VOUT 12VOUT XVD GND GND GND GND C Y 5V 5V VIDEO EXT-SYNC GND GND KEYIN SWIN DIR 232/X485 TXD2 RXD2 CD0 CD1 CD2 CD3

MB: 12VOUT 12VOUT 12VOUT XVD GND GND GND GND C Y 5V 5V VIDEO EXT-SYNC GND GND KEYIN SWIN DIR 232/X485 TXD2 RXD2 CD0 CD1 CD2 CD3

ME: 12V GND 12V GND 12V GND GND 5V 3.5V 5V 3.5V 5V -7.5V 15V 6.8V

DE: 12V GND 12V GND 12V GND GND 5V 3.5V 5V 3.5V 5V -7.5V 15V 6.8V

⚠ PCB-POWE
P. ①

LENS-UNIT

HOLE SENSOR (4) (3) (2) (1)

Ⓜ IRIS UNIT (6) (5)

Ⓜ FOCUS MOTOR (18) (17) (16) (15)

Ⓜ ZOOM MOTOR (10) (9) (8) (7)

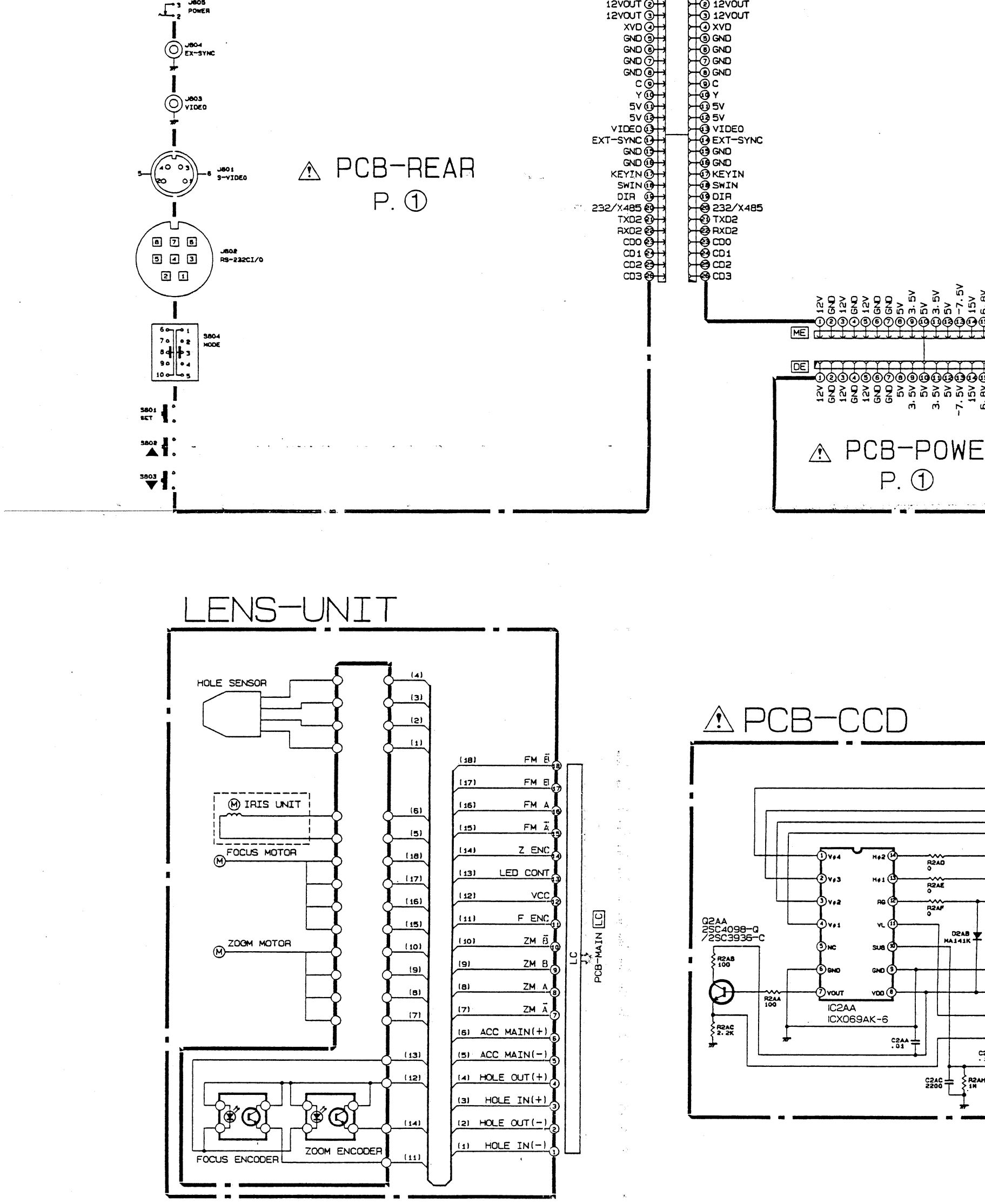
(13) (12)

(18) FM Ē (18)
(17) FM E (17)
(16) FM A (16)
(15) FM Ā (15)
(14) Z ENC (14)
(13) LED CONT (13)
(12) VCC (12)
(11) F ENC (11)
(10) ZM B̄ (10)
(9) ZM B (9)
(8) ZM A (8)
(7) ZM Ā (7)
(6) ACC MAIN(+) (6)
(5) ACC MAIN(−) (5)
(4) HOLE OUT(+) (4)

LC PCB-MAIN LC

⚠ PCB-CCD

Q2AA 2SC4098-Q /2SC3936-C
R2AB 100
R2AA 100
R2AC 2.2K
IC2AA ICX069AK-6
C2AA .01
C2AC 2200
R2AD 0
R2AE 0
R2AF 0
R2AH 1M
D2AB MA141K
V∮4 V∮3 V∮2 V∮1 NC GND VOUT H∮2 H∮1 RG VL SUB GND VDD


J805
POWER
J804
EX-SYNC
J803
VIDEO
J801
S-VIDEO
J802
RS-232CI/O
S804
MODE
S801
SET
S802
S803
PCB-REAR
P. ①
12VOUT
12VOUT
XVD
GND
GND
GND
GND
C
Y
5V
5V
VIDEO
EXT-SYNC
GND
GND
KEYIN
SWIN
DIR
232/X485
TXD2
RXD2
CD0
CD1
CD2
CD3
ME
DE
12V
GND
5V
3.5V
-7.5V
15V
PCB-POWE
P. ①

LENS-UNIT
HOLE SENSOR
IRIS UNIT
FOCUS MOTOR
ZOOM MOTOR
FOCUS ENCODER
ZOOM ENCODER
FM B̄
FM B
FM A
FM Ā
Z ENC
LED CONT
VCC
F ENC
ZM B̄
ZM B
ZM A
ZM Ā
ACC MAIN(+)
ACC MAIN(-)
HOLE OUT(+)
HOLE IN(+)
HOLE OUT(-)
HOLE IN(-)
LC
PCB-MAIN LC

PCB-CCD
Q2AA
2SC4098-Q
/2SC3936-C
IC2AA
ICX069AK-6
D2AB
MA141K

⚠ PCB-MAIN
P. ②

EVR-CONTROLLER
(For Adjustment)

B-POWER
P. ①

⚠ PCB-REAR

CD

NOTE TL-XXX MEANS TEST
TP-XXX MEANS CHEC

5 6 7 8 9 10

AM

-CCD
①

LENS-UNIT
P. ①

FM B̄
FM B
FM A
FM Ā
Z ENC
LED CONT
VCC
F ENC
ZM B̄
ZM B
ZM A
ZM Ā
ACC MAIN(+)
ACC MAIN(−)
HOLE OUT(+)
HOLE IN(+)
HOLE OUT(−)
HOLE IN(−)

LC

HOLE IN(−) HOLE OUT(−) HOLE IN(+) HOLE OUT(+) ACC MAIN(−) ACC MAIN(+) ZM Ā ZM A ZM B̄ ZM B F ENC VCC LED CONT Z ENC FM Ā FM A FM B̄ FM B

⚠ PCB-MAIN
P. ②

EVR-CS EVR-SI EVR-SO EVR-CLK GND

MV

EVR-CONTROLLER
(For Adjustment)

12V GND GND 5V 3.5V 5V 3.5V 5V -7.5V 15V 6.8V 6.8V GND-M GND-M

CB-POWER
P. ①

⚠ PCB-REAR

CD

Vφ4 SUB Vφ3 Vφ2 Vφ1 Hφ2 Hφ1 RG GND VDD VL VOUT

R2AD 0
R2AE 0
R2AF 0
C2AB .01
D2AB MA141K
R2AB 100K
AK-6
C2AA .01
C2AD .1
D2AA MA141K
C2AC
R2AM
R2AJ
C2AE 1μ

CA
PCB-MAIN MA

TL-12VOUTB
12V OUT
12V OUT
12V OUT
TL-XVDB
XVD
TL-GNDB
GND
GND
GND
GND
C
Y
5V
5V
VIDEO
EXT-SYNC
GND
GND
KEY IN
SW IN

TL-COUT
TL-YOUT
TL-5VB
C OUT
Y OUT
GND
J801 (DIN4PIN)
TL-VIDEO
TL-EXTSYNC
J804 EXT-SYNC
R801 75
VIDEO OUT
J803 (BNC)
ZB01 .8A
C803 .022
12V
J805

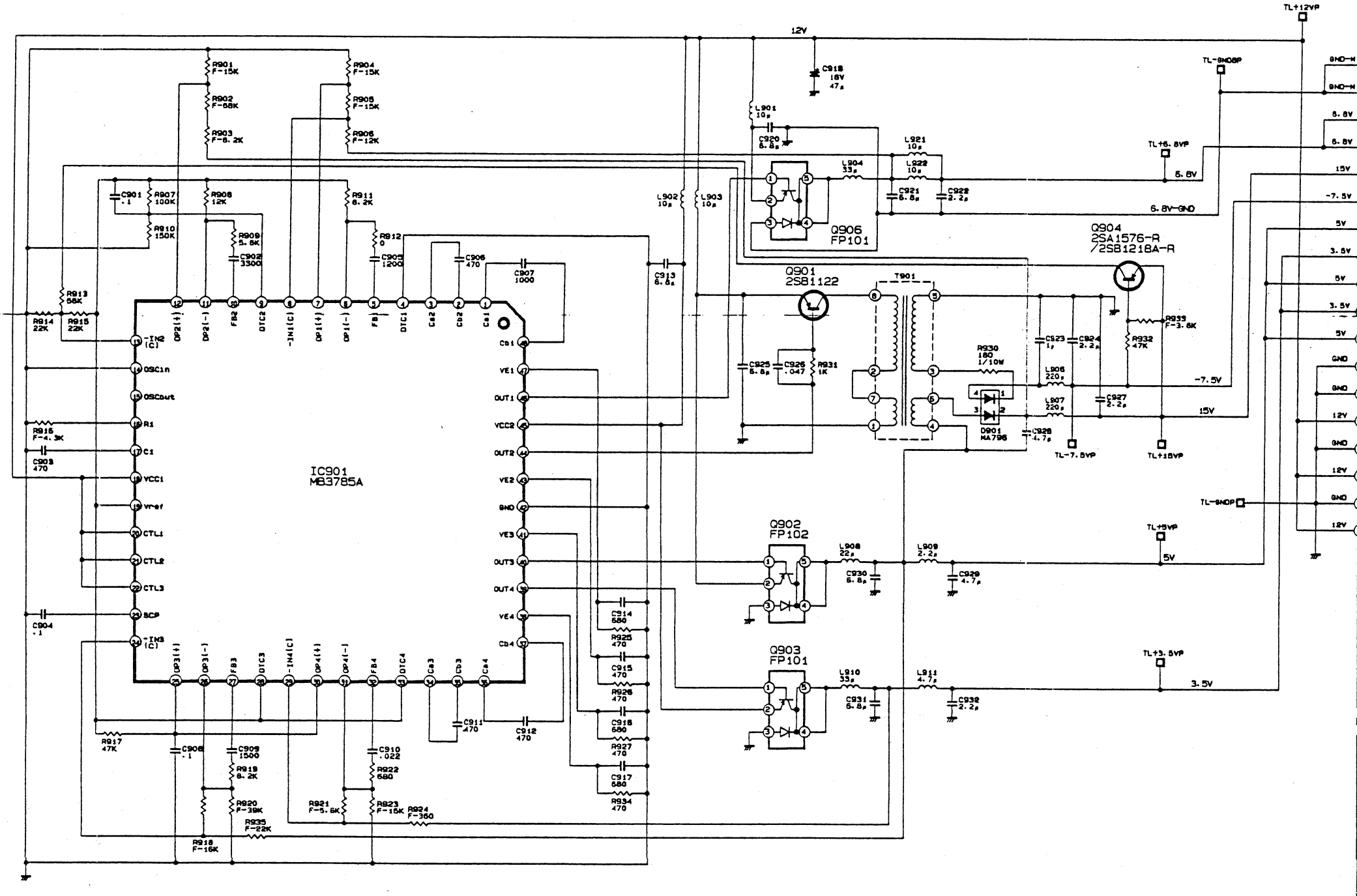
PCB-MAIN MB
RB

TL-12VOUTD
12V OUT
12V OUT
12V OUT
12V OUT
TL-XVDD
XVD
TL-GNDD
GND
GND
GND
GND
GND
TL-CD00
CD0
TL-CD10
CD1
TL-CD20
CD2
TL-CD30
CD3
GND
GND
GND
TL-12V
12V
12V

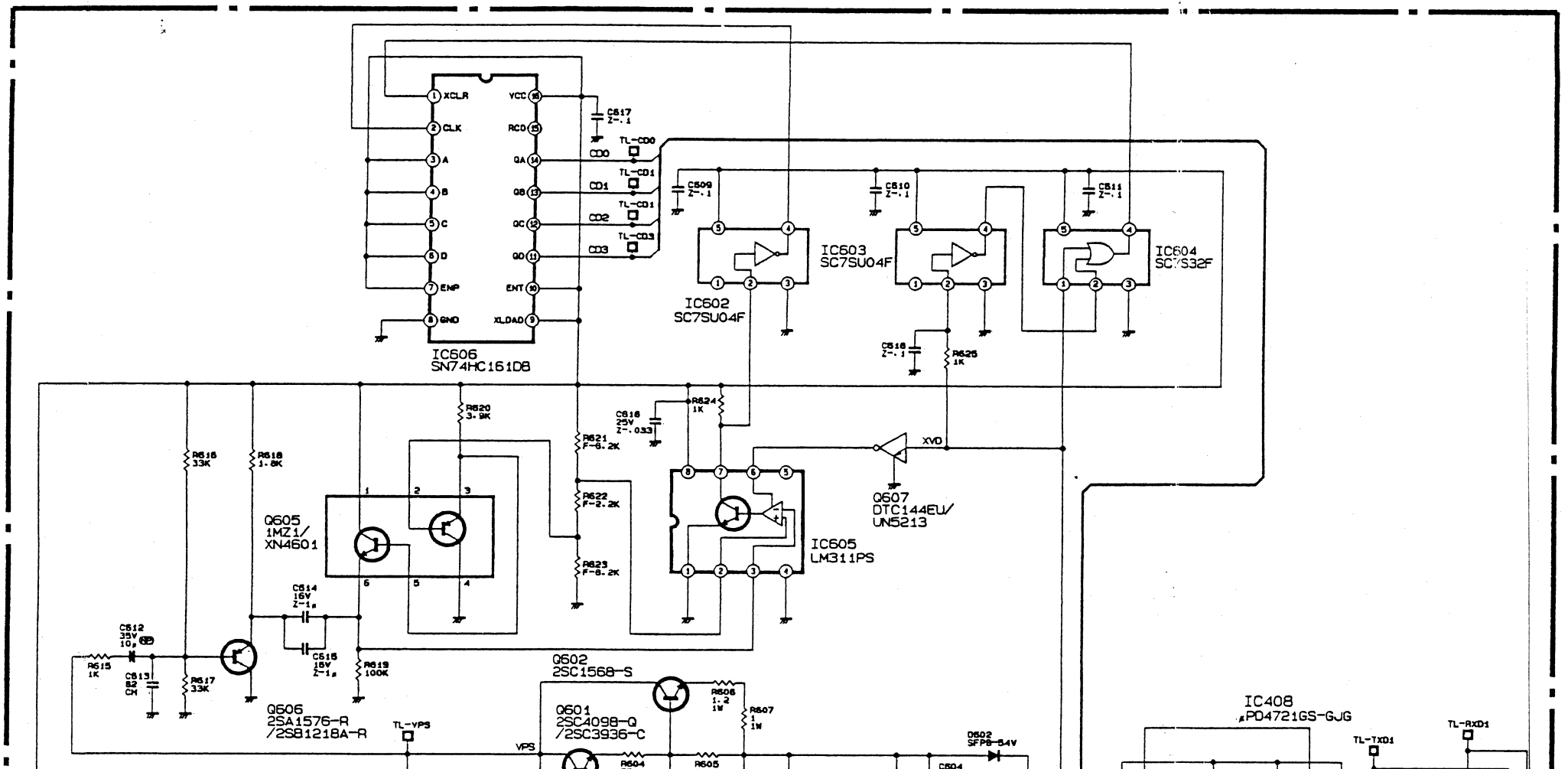
RD

R814 22K
R815 4.3K
C803 470
C804 .1

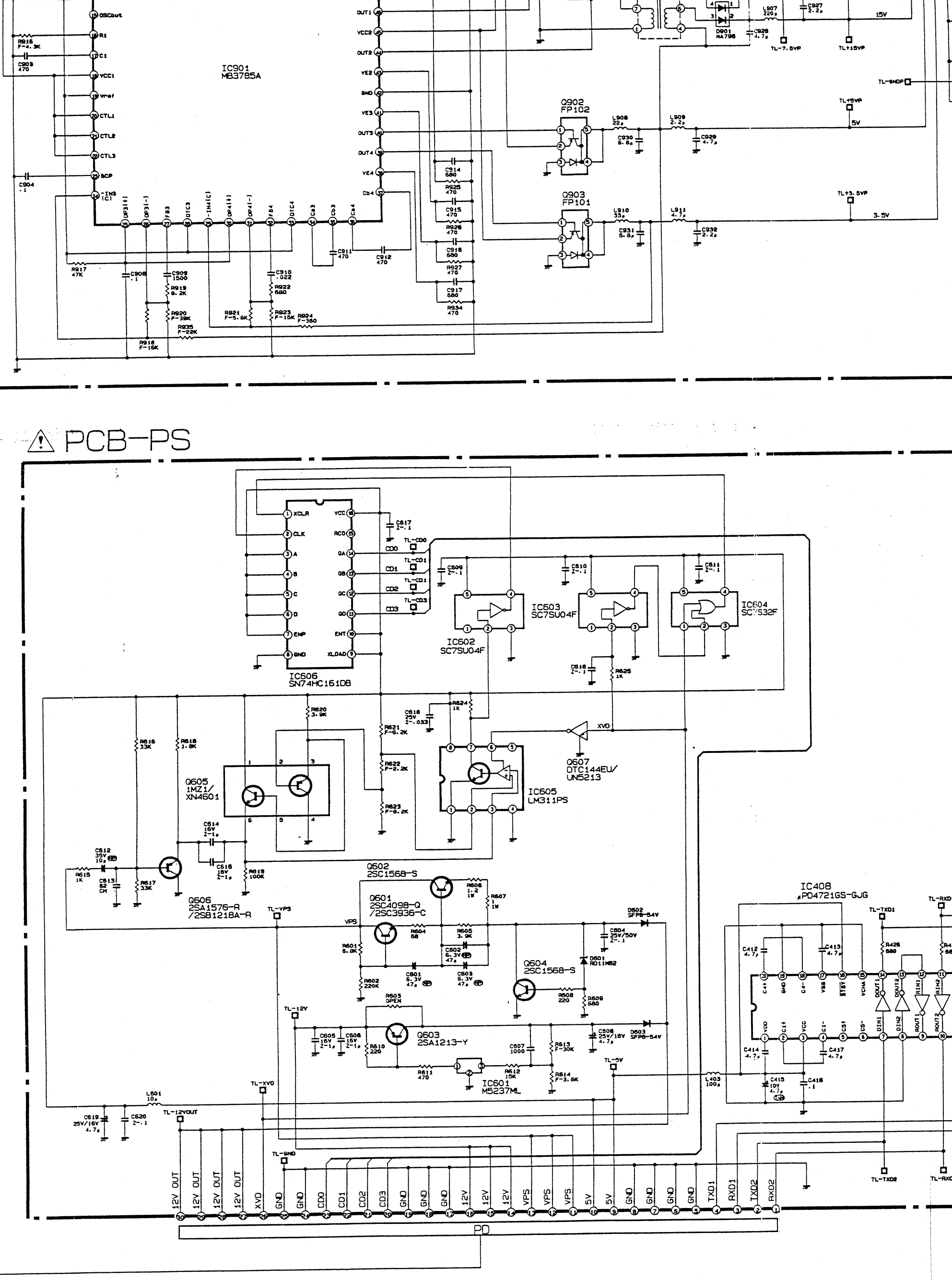
⚠ PCB-POWER



⚠ PCB-PS



⚠ PCB-PS



NOTE TL-XXX MEANS TEST LAND
TP-XXX MEANS CHECKER CHIP

Tolerance	G=±2%	P=+100%	Q=+30%	C=±0.25PF
	J=±5%	−0%	−10%	D=±0.5PF
	K=±10%	Z=+80%	T=+200%	F=±1PF
	M=±20%	−20%	−0%	G=±2PF

Sort	I	Parts except for chips	Not indicated : Ceramic capacitor (MF) : Polyester capacitor (PP) : Polypropylene film capacitor (ALM) : Aluminus electrolytic capacitor (TF) : Twin film capacitor (SC) : Semiconductor ceramic capacitor (MP) : Metalized paper (MPP) : Metalized plastic film capacitor (MMF) : Metalized polyester capacitor (MF.PP) : Polyester polypropylence film capacitor (PS) : Styrol capacitor (TAN) or (TANT) : Tantalum capacitor — ‖ — : Electrolytic capacitor (BP) or (NP) : Non polarized electrolytic capacitor
	II	Chips	Not indicated : Ceramic capacitor chip — ‖ — : Electrolytic capacitor (BP) or (NP) : Non polarized electrolytic capacitor chip
Characteristic (only ceramic capacitor)	Not indicated : F or B(high dielectric percentage) CH,SL,etc. : Temperature compensating types		

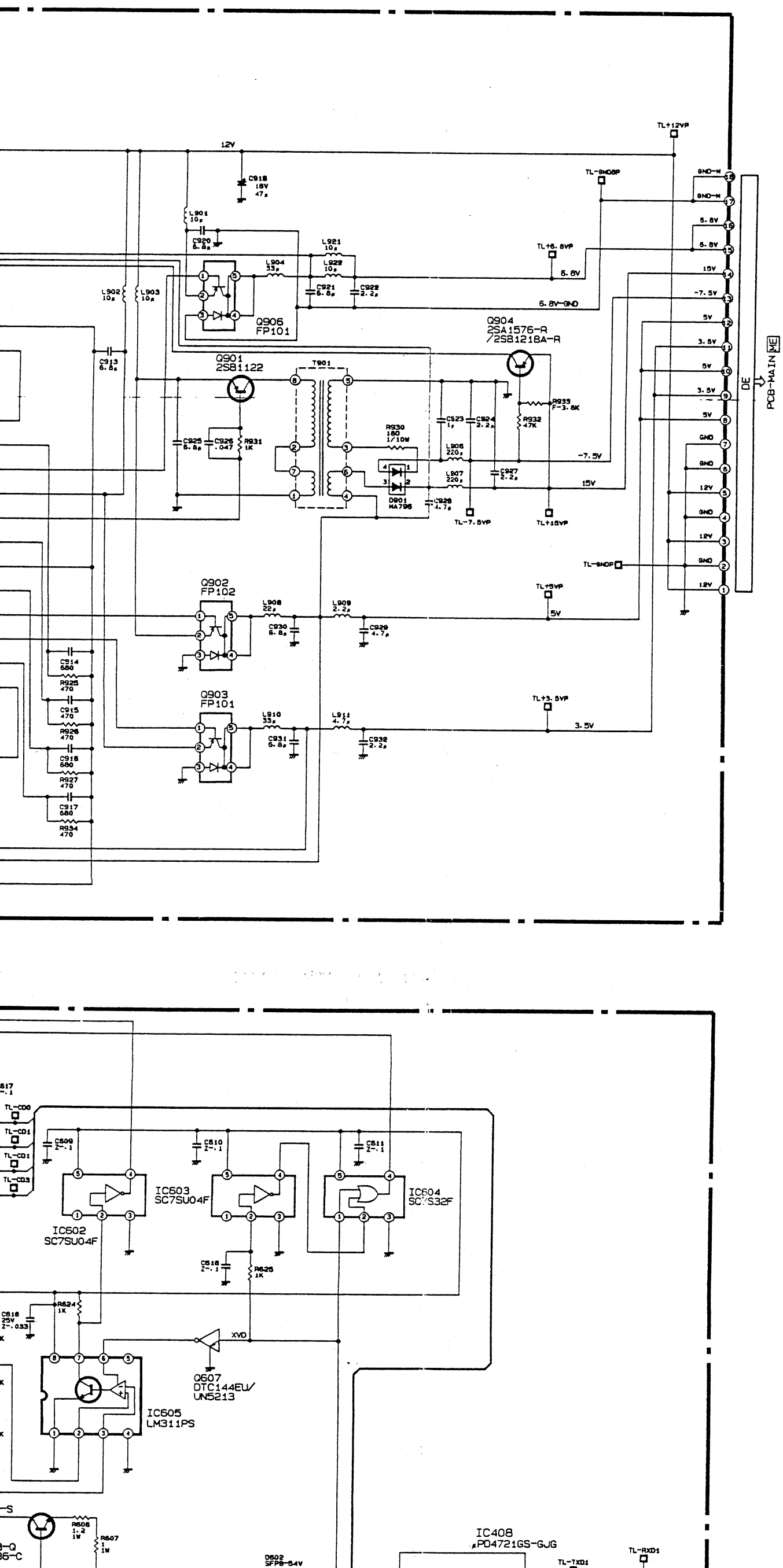
3. Resistors

Value	Not indicated = Ω K = kΩ(1000Ω) M = MΩ(1000kΩ)		
Wattage	Parts except for chips	Not indicated = 1/4W or 1/6W	
	Chips	Not indicated = 1/10W	
Tolerance	Not Indicated =±5% D=±0.5% J=±5% F=±1% K=±10%		
Short	I	Parts except for chips	Not indicated : Carbon resistor (S) : Fixed composition resistor (MS) : Metal oxide film resistor(type B) (CE) : Cemented resistor (W) : Wire wound resitor (M) : Metal film resistor (MPC) : Metal plate cement resistor (ML) : Metal liner resistor
	II	Chip	Not indicated : Chip resistor

4. This is a basic schematic diagram. Some sets may be subject to modification according to engineering improvement.

SPECIFIC SYMBOL

Zener Diode	Crystal unit
Varicap	Air Gap
Posistor	Part(resistor) attached on the copper-foil side of PCB
Thermistor	Ceramic filter
Fusible Resistor	



SERVICING PRECAUTION

SYMBOLS INDICATE COMPONENTS HAVING SPECIAL CHARACTERISTICS IMPORTANT TO SAFETY AND PERFORMANCE. THERFORE REPLACEMENT OF ANY SAFETY PARTS SHOULD BE IDENTICAL IN VALUE AND CHARACTERISTICS. FOR ACCURACY OF THE REPLACEMENT REFER TO THE PARTS LIST OF SERVICE MANUAL.
DON'T DEGRADE THE SAFETY OF THE VIDEO CAMERA THROUGH IMPROPER SERVICING.

SCHEMATIC DIAGRAM
MODEL : CCD-400E

• **NOTE**

1. TP6A, etc. show Test Points.
2. CAPACITORS

Value	Not indicated	PF, for numbers more than 1 μF, for numbers less than 1
Dielectric Strength	Not indicated :50V	
Tolerance	Not indicated =±10%	No Tolerance is indicated for electrolytic capacitors and ±20%
	G=±2% P=+100% Q=+30% C=±0.25PF J=±5% −0% −10% D=±0.5PF K=±10% Z=+80% T=+200% F=±1PF M=±20% −20% −0% G=±2PF	
Sort	I Parts except for chips	Not indicated : Ceramic capacitor (MF) : Polyester capacitor (PP) : Polypropylene film capacitor (ALM) : Aluminus electrolytic capacitor (TF) : Twin film capacitor (SC) : Semiconductor ceramic capacitor (MP) : Metalized paper (MPP) : Metalized plastic film capacitor (MMF) : Metalized polyester capacitor (MF.PP) : Polyester polypropylence film capacitor (PS) : Styrol capacitor (TAN) or (TANT) : Tantalum capacitor —‖— : Electrolytic capacitor (BP) or (NP) : Non polarized electrolytic capacitor
	II Chips	Not indicated : Ceramic capacitor chip —‖— : Electrolytic capacitor (BP) or (NP) : Non polarized electrolytic capacitor chip
Characteristic (only ceramic capacitor)	Not indicated : F or B(high dielectric percentage) CH,SL,etc. : Temperature compensating types	

3. Resistors

Value	Not indicated = Ω K = kΩ(1000Ω) M = MΩ(1000kΩ)	
Wattage	Parts except for chips	Not indicated = 1/4W or 1/6W
	Chips	Not indicated = 1/10W
Tolerance	Not indicated =±5% D=±0.5% J=±5% F=±1% K=±10%	
Short	I Parts except for chips	Not indicated : Carbon resistor (S) : Fixed composition resistor (MB) : Metal oxide film resistor(type B) (CE) : Cemented resistor (W) : Wire wound resitor (M) : Metal film resistor (MPC) : Metal plate cement resistor (ML) : Metal liner resistor
	II Chip	Not indicated : Chip resistor

4. This is a basic schematic diagram. Some sets may be subject to modification according to engineering improvement.

SPECIFIC SYMBOL

Zener Diode	Crystal unit
Varicap	Air Gap
Posistor	Part(resistor) attached on the copper-foil side of PCB
Thermistor	Ceramic filter
Fusible Resistor	

⚠ PCB—MAIN

AF&ZOOM DRIVE

IC501 TB6512AF

IC502 TB6512AF

IC503 NJM2902V IRIS-DRV

IC504 IMX1

IC507 NJM2107F

IC508 TC4W53FU

Q501 DTC144EU/UN5213

Q502 2SC4081-R /2SD1819A-R

Q503 2SC4081-R /2SD1819A-R

Q905 2SC4081-R /2SD1819A-R

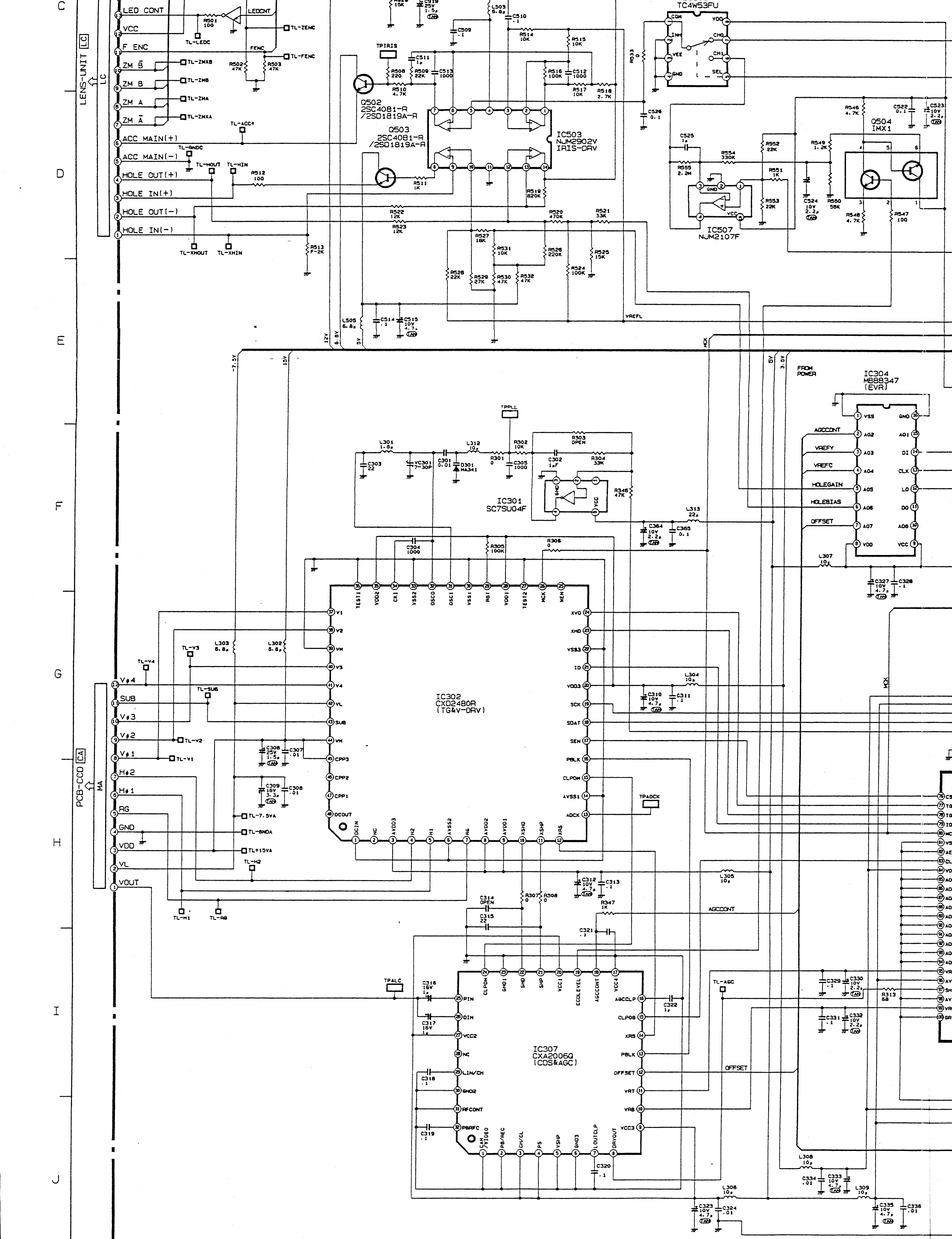
IC301 SC7SU04F

IC302 CXD2480R (TG&V-DRV)

IC304 M88347 (EVR)

LENS-UNIT [LC]

PCB-CCD [CA]


LENS-UNIT LC
LED CONT
VCC
F ENC
ZM B̄
ZM B
ZM A
ZM Ā
ACC MAIN(+)
ACC MAIN(−)
HOLE OUT(+)
HOLE IN(+)
HOLE OUT(−)
HOLE IN(−)
TL-LEDC
TL-ZMXB
TL-ZMB
TL-ZMA
TL-ZMXA
TL-ACC+
TL-GNDC
TL-HOUT
TL-HIN
TL-XHOUT
TL-XHIN
TL-FENC
TL-ZENC
LEDCNT
FENC
TPIRIS
Q502
2SC4081-R
/2SD1819A-R
Q503
2SC4081-R
/2SD1819A-R
IC503
NJM2902V
IRIS-DRV
TC4W53FU
IC507
NJM2107F
Q504
IMX1
VREFL
12V
6.8V
5V
-7.5V
15V
6V
3.5V
HCK
FROM POWER
IC304
MB88347
(EVR)
AGCCONT
VREFY
VREFC
HOLEGAIN
HOLEBIAS
OFFSET
TPPLL
IC301
SC7SU04F
IC302
CXD2480R
(TG&V-DRV)
TPADCK
TPALC
IC307
CXA2006Q
(CDS&AGC)
TL-AGC
OFFSET
PCB-CCD CA
MA
V♦4
SUB
V♦3
V♦2
V♦1
H♦2
H♦1
RG
GND
VDD
VL
VOUT
TL-V4
TL-V3
TL-V2
TL-V1
TL-SUB
TL-7.5VA
TL-GNDA
TL+15VA
TL-H2
TL-H1
TL-RG
AGCCONT

CCD-400E

MAIN SIGNAL PROCESS

IC505
S-29191AFJ

IC304
MB88347
(EVR)

IC303
TA75W01FU

IC305
CXD2163R
(SIGNAL PROCESS DSP)

IC409
TC74LVX04FS

IC403
TC74LVX04FS

IC404
TC74VHCT04FS

Q504
IMX1

FROM
OP. MICON
AFM-XCS. SB00. SBI0.
SBT0

FROM
OP. MICON
XCS. SO. SI. SCK. XCLR.
MCK. HD. VD

TO
OUTPUT
IOY. IOC.
EXT-SYNC. LL

TO
AF-DSP&MICON
AFY. MCK. HD. VD.
VREFH. VREFL

TO
AF-MICON
AFM-XCS. SB00. SBI0

TO
SIGNAL PROCESS DSP
XCS. SO. SI. SCK.
XCLR. HD. VD. MCK

NOTI

AF. MICON & AF DSP

IC504
MN1882010
(AF-MICON)

IC505
S-29191AFJ

Q504
IMX1

IC304
M888347
(EVR)

IC303
TA75W01FU

IC409
TC74LVX04FS

FROM POWER

FROM MAIN SIGNAL PROCESS
VREFL, VREFH,
HD, VD, MCK, AFY

FROM
OP. MICON
AFM-XCS, SB00, SBI0,
SBT0

TO
OUTPUT
IOY, IOC,
EXT-SYNC, LL

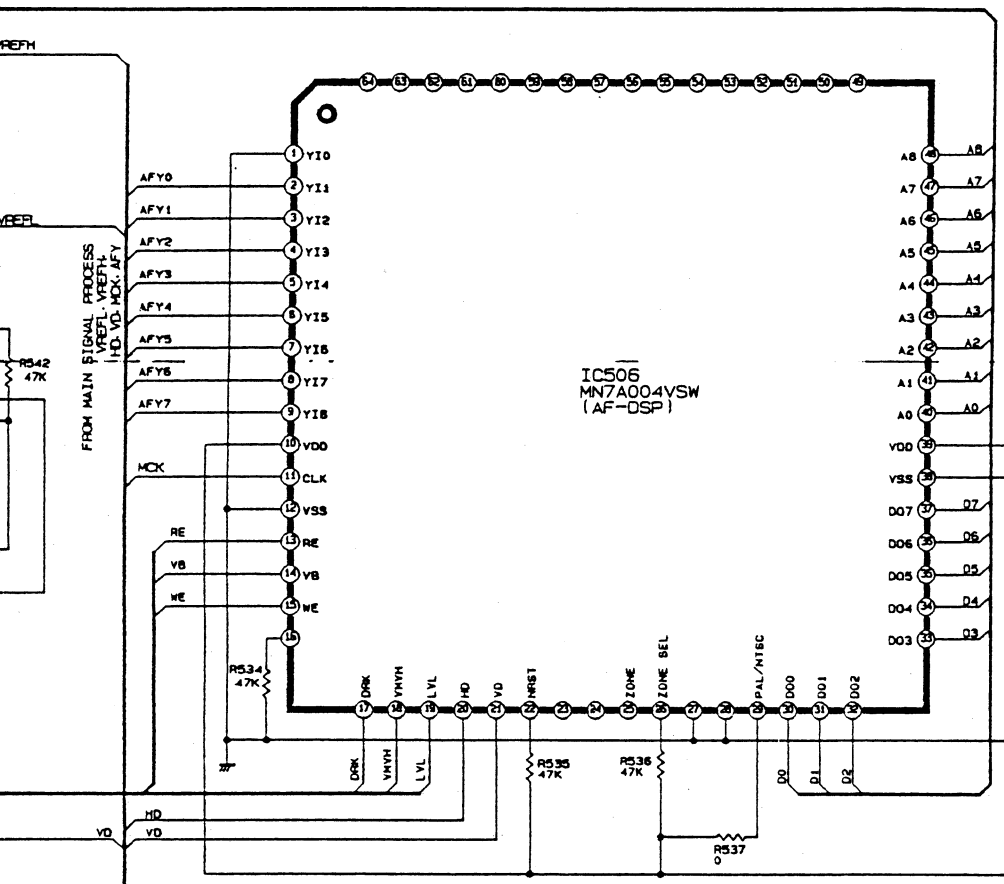
FROM
OP. MICON
XCS, SO, SI, SCK, XCLR,
MCK, HD, VD

TO
AF-DSP&MICON
AFY, MCK, HD, VD,
VREFH, VREFL

TO
AF-MICON
SB00, SBI0, SBT0

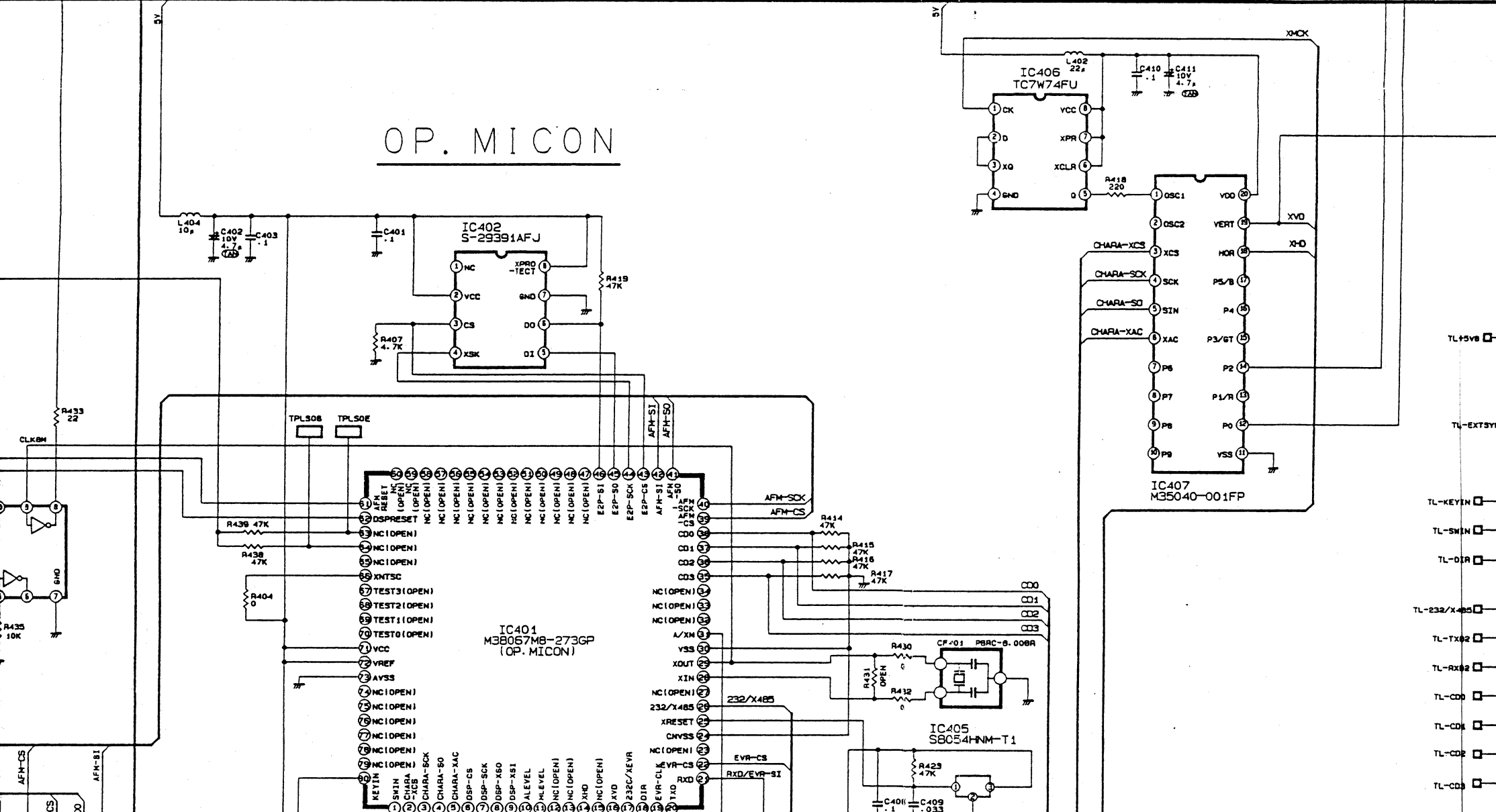
10 11 12 13 14 15

AF DSP



OUTPUT

OP. MICON



OUTPUT

OP. MICON

IC401
M38067M8-273GR
(OP. MICON)

IC402
S-29391AFJ

IC405
S8054HNM-T1

IC406
TC7W74FU

IC407
M35040-001FP

IC410
TC7W241FU

Q301
2SA1576-R
/2SB1218A-R

Q302
2SC4098-Q
/2SC3936-C

Q303
2SA1576-R
/2SB1218A-R

Q304
2SC4098-Q
/2SC3936-C

IC308
MM1024AFF

FROM MAIN SIGNAL PROCESS

NOTE TL-XXX MEANS TEST LAND
TP-XXX MEANS CHECKER CHIP

OUTPUT

P. MICON

IC401
M38067M8-273GP
(OP. MICON)

IC402
S-29391AFJ

IC405
S8054HNM-T1

IC406
TC7W74FU

IC407
M35040-001FP

IC410
TC7W241FU

Q301
2SA1576-A
/2SB1218A-A

Q302
2SC4098-Q
/2SC3936-C

Q303
2SA1576-A
/2SB1218A-A

Q304
2SC4098-Q
/2SC3936-C

IC308
MM1024AFF

LF301
MXF35350R180

FROM MAIN SIGNAL PROCESS

EXT-SYNC

PCB-REAR RB

MB

MV

EVA-CONTROLLER
(For Adjustment)

※ TL-XXX MEANS TEST LAND
TP-XXX MEANS CHECKER CHIP

OUTPUT

ICON

TL-GNDSE
GND-M
6.8V-GND
TP6R8V
6.8V
TL+15VE
15V
TL-7.5VE
-7.5V
TL+5VE
5V
TL+3.5VE
3.5V
TPGND
GND
TL+12VE
12V
TL-GNDE
PCB-POWER DE
ME

3.5V
5V
L310 10μ
L504 6.8μ
C516 .1
C517 10V 4.7μ

Q302 2SC4098-Q /2SC3936-C
R344 2.2K
LF301 MXF353ER180
R326 1K
R327 1K
C350 1μ
C351 .1
C352 10V 4.7μ
IOY
R328 F-200
Q301 2SA1576-R /2SB1218A-R
R329 2.2K
C360 1μ
R330 1M
IC308 MM1024AFF
VCC YIN EDGIN CHARA SUB YOUT VOUT SUB
R C PBIN VSYNC CIN CMUTE COUT GND

C353 16V 10μ
C354 6.3V 100μ
C356 25V 22μ
C357 25V 22μ
C358 25V 22μ
C361 25V 22μ
C362 25V 22μ
C363 35V 10μ
C359 .1
R337 68
R339 22K
TL-YOUT
TPVDO
R338 68
R340 22K
TL-COUT
R341 68
R342 22K

Q303 2SA1576-R /2SB1218A-R
R331 3.3K
C347 18p
L311 68μ
C348 .01
R345 2.7K
R334 1.2K
R333 4.7K
R335 4.7K
R336 1K
Q304 2SC4098-Q /2SC3936-C
IOC
C349 .01

FROM MAIN SIGNAL PROCESS
LL
TL-LL
EXT-SYNC

IC406 TC7W74FU
CK D XQ GND VCC XPR XCLR Q
L402 22μ
C410 .1
C411 10V 4.7μ
XMCK
R418 220

IC407 M35040-001FP
OSC1 OSC2 XCS SCK SIN XAC P6 P7 P8 P9 VDD VERT HOR P5/B P4 P3/GT P2 P1/R P0 VSS
CHARA-XCS CHARA-SCK CHARA-SO CHARA-XAC
XVD XHD

TL+12VOUT
12VOUT
TL-XVD
XVD
TL-GNDS
GND
C
Y
5V
VIDEO
EXT-SYNC
MB
PCB-REAR RB

TL+5VB
TL-EXTSYN

TL-KEYIN
TL-SWIN
TL-DIR
TL-232/X485
TL-TXD2
TL-RXD2
TL-CD0
TL-CD1
TL-CD2
TL-CD3
R436 47K
KEYIN
SWIN
DIR
232/X485
TXD/EVR-SO TXD2
RXD2
CD0
CD1
CD2
CD3

IC401 M3067M8-273GP (OP.MICON)
D00 D01 D02 D03 D04 D05 D06 D07
A0 A1 A2 A3 A4 A5 A6 A7 A8
VDD VSS
R414 47K
R415 47K
R416 47K
R417 47K
AFM-SCK
AFM-CS
AFM-SI
AFM-SO
E2P-SI E2P-SO E2P-SCK E2P-CS
NC(OPEN)
A/XN XOUT XIN XRESET CNVSS
R430 0
R431 OPEN
R432 0
CF401 PBRC-8.008R
232/X485
EVR-CS
RXD/EVR-SI
EVR-CLK
TXD
R429 47K
C401 C409
XVD XHD
DSP-XSI
ALEVEL
232C/XEVR
DIR
R419 47K
XPRO -TECT
GND DO DI